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MAJOR UROLOGICAL OPERATIONS UNDER REGIONAL ANESTHESIA*

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REGIONAL Anesthesia as a method of rendering the patient insensible to pain during major urologic operations, has won a fixed and permanent place in our Clinic. As our experience increases our enthusiasm grows.

During the first year and a half, the surgeons of the department were obliged to give the anesthesia themselves. This is entirely unnecessary, and has been corrected by the employment of an Anesthetist, who gives all types of anesthesia. The administration of regional anesthesia is not a trick performance. It is based on sound anatomic principles and anyone willing to make a careful study of the various procedures necessary, can accomplish it.

We feel very strongly that there is a firm place established in the Science and Art of Medicine by the trained Doctor Anesthetist. In order to maintain the high place attained in our midst, he must perfect himself in every type of anesthesia, including all kinds of inhalation, colonic ether and regional as well. It is not proper or fitting, that the Surgeon, who should be busy doing research work in his spare time, should be obliged to administer routine anesthesias of any description.

Most procedures in surgery seem to be fairly well standardized with the possible exception of operations in the thoracic region and upon the brain. Therefore it seems reasonable to presume that the next great advance in surgery will be along the line of anesthesia. Our personal opinion is that this will take the form of discoveries of new anesthetic agents of less toxicity and better methods of administering them.

Practice makes perfect in this field, as well as in all others. We feel that the last twenty-five cases that we personally injected, were more thoroughly anesthetized than the first twenty-five. We also feel sure that our regular Anesthetist, does them better than we do.

Sacral anesthesia was originated by F. Cathelin and Durant in 1902, who sought to relieve sexual neuroses and incontinence of urine by injections into the sacral canal. Since this beginning, many modifications have been suggested and methods perfected, by a large number of active workers, so that now we are able to do any major operation upon the bladder, prostate, urethra or sexual organs under its influence.

Three years after the publication of the original work by Cathelin and Durant, Hugo Sellheim reported his experimental work on surgery of the abdomen. It was not until 1911 however, that paravertebral anesthesia was applied to urologic surgery. In that year Läwen successfully performed a nephrotomy for stone on an old man under its influence. Much clinical and experimental work has been done in Europe since the humble beginning mentioned above. This was interrupted during the World War, but received new impetus immediately thereafter.

In America interest has not been widespread. Several pioneers have written articles from time to time, but the profession as a whole, has been slow to adopt the methods described. The formation, last year of the American Society of Regional Anesthetists, seems to be an important step forward in the dissemination of knowledge regarding this most important milestone in the march of surgical progress.

PRE-OPERATIVE PREPARATION

It is our custom to limit purgation to a period at least twenty-four hours before operation. It is considered that purgation is necessary, but if it is done immediately before operation, usually it results in a sleepless night and considerable dehydration, so that instead of feeling fit the patient is weakened and depressed. Alkaline solutions are administered by mouth or rectum during the period immediately preceding operation. Fortunately, when a patient is operated upon by means of regional anesthesia, he may take fluids up to, during, and immediately after operation, a most important consideration in diseases of the urinary organs.

It was formerly a routine procedure to administer morphine in divided doses after the method recommended by Gwathmey. Due to the experience and researches of Dr. J. Gordon Anderson of our staff, we have become convinced that preliminary narcosis is entirely unnecessary. In fact, we feel that by eliminating morphine we avoid nausea and vomiting at the time of operation, illeus, constipation and suppression of urination after operation. Furthermore it is impossible to see any advantage obtained by the use of morphine in the effectiveness of the anesthesia. If the patient is nervous or excited a whiff of ether or aromatic spirits of ammonia seems to be a much more effective method of quieting him than any amount of preliminary narcosis.

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SOLUTIONS USED AND METHODS OF ADMINISTRATION

Up to the present time we have found no solution more satisfactory for general use than procain. It is well to consider 1 grain to be the maximum dose of procain for each 100 lbs., body weight of the patient. Frequently much less than this amount is used. A solution of 1% is ordinarily quite satisfactory. This is sometimes diluted to ½% and occasionally 2% may be utilized.

This solution is freshly made and sterilized by boiling about one hour before use.

The addition of adrenalin or other drugs to the procain solution is strictly contra-indicated, the former because it adds decidedly to the toxicity of the drug and the latter because they are ineffective.

We have long been under the impression, from clinical observation that adrenalin added to local anesthetic contributes greatly to its toxicity without adding any material benefit whatever. Those who advocate its use believe that it is not rapidly absorbed. This opinion is differed with strongly by Dr. Murray Lyon of the University of Edinburgh (*Jour. of Experimental Medicine,* Dec. 1st, 1923—Vol. XXXIII, No. 6, page 655) who states:—"The impression seems to be widely prevalent that Adrenalin, given subcutaneously, causes little general effect and its action is quite uncertain. This view is probably based on the blanching of the skin which is seen around the site of injection, and on the fact that Adrenalin causes vasoconstriction of some vessels. But the spectacular relief from distressing symptoms that occurs in asthmatics within a few minutes after a hypodermic injection of a minute dose of Adrenalin has been given, is in itself evidence that absorption by this route is rapid and unsatisfactory. It is suggested that absorption can take place freely by Lymphatic channels."

Emil Mayer (*Jour. of the American Medical Assn.,* March 15th, 1924, Vol. LXXXII, page 876) states, ".......... And it seems probable that adrenalin was a contributing factor in many of the deaths recorded." The statement that "animals bear larger doses of procain when small doses of epinephrin are injected simultaneously into the veins" is not based on animal experimentation, at least no experiments are quoted.

Leo Schmidt (*Göttinger Thesis,* 1919) states that the fatal action of subcutanesous and intravenous administration of adrenalin in guinea pigs has a very uniform foundation.

The cause of death is always to be found in lung haemorrhages perhaps with the additional action of a lung edema, which leads to death by suffocation without striking individual variation in susceptibility from a definite, sufficiently sharply defined border dose.

Braun (*Local Anesthesia,* 1924, page 67) states "Like all narcotic substances they (local anesthetics) are all protoplasmic poisons, paralyzing not only the nerve elements but the function of all protoplasm with which they come in active contact. This action they possess in common with many other active substances, even with the physical action of water upon protoplasm. Their intense selective affinity for nerve substances is particularly characteristic. They paralyze the function of nerve tissues with which they come in active contact in solutions too weak to appreciably influence other kinds of protoplasm. The affinity of these substances for nervous tissue makes them particularly toxic to the central nervous system.

Thus, we see that both the local anesthetics and epinephrin have a special affinity for the nervous system. When injected intravenously into experimental animals in toxic doses they produce nervous symptoms, excitement, convulsions, central paralysis and finally death by respiratory or cardiac paralysis. Epinephrin is 450 times more toxic than procain for experimental animals.

Meeker and Frazer (*Jour. of Pharmacology and Experimental Therapeutics,* Vol. XXII, No. 5, Dec. 1923: "In certain regions absorption is more rapid than in others, for example, in the sacral canal and on each side of the vertebral column, a fact which accounts for a great likelihood of toxic manifestations in paravertebral and sacral anesthesia.—Injections should be made cautiously if strong solutions are used about the head, pharynx and sacral canal.—No doubt the incidence of reactions to local anesthetics would be greatly reduced were it possible to dispense entirely with adrenalin. We would even take issue with Braun's contention that local anesthetics should be compatible with adrenalin and maintain that the drug replacing procain for local anesthesia should be either more powerfully anesthetic in proportion to toxicity or less toxic in proportion to anesthetic power, making adrenalin unnecessary."

It was observed by Emil Goetsch some years ago that the addition of adrenalin in the case of a patient suffering from hyperthyroidism often produces such an intense excitement as to become almost maniacal, thus rendering operation out of the question entirely.

The details of administration of sacral, parasacral, and paravertebral anesthesia have been described by the author in previous publications, and will not be repeated here, except as shown on the screen.

It is well to reiterate, however that the greatest degree of orderliness and quiet should be observed in the anesthetising room. All evidence of hurry or bustle should be eliminated. The patient should be accompanied by the anesthetist who by helpful suggestions will keep the patient's attention diverted at certain times.

In a department where patients are continually being operated upon by this method, they gradually take such an anesthesia as a matter of course and no questions are raised. When the occasional skeptic is encountered it is wise to explain the advantages of this type of anesthesia and not only promise him that he will not be hurt, but live up to that promise.

In performing operations under regional anesthesia, it is well to remember that the patient feels everything that is being done, apparently through a certain muscle sense, that is not elimnated by the anesthetic. This feeling persists, but is not accompanied by pain. Therefore, it is important that all procedures be done with extreme gentleness. Sudden excessive retraction is to be avoided. The operation should be carried forward by careful dissection, all tearing of tissues and rough handling is to be strictly avoided. Incisions should be larger than those utilized when a general anesthesia is used, thus avoiding excessive retraction.

UNTOWARD—RESULTS

The supreme disadvantage of this type of anesthesia is that whatever is injected cannot be extracted, therefore the administration of the drug is very slow and deliberate. It is stopped immediately if there is any change in blood pressure or pulse rate, and not continued until the disturbing signs have been eliminated. This is a very rare occurrence.

One case had a spasmodic contraction of his legs which soon passed away and his prostate removed without further disturbance.

A patient whose prostate was removed satisfactorily developed a cellulitis of the sacrum. This is the only case of infection in the entire series that could be ascribed to the drug.

Our observation is that there is no evidence that phlebitis is any more liable to develop with this type of anesthesia than any other form.

The following are brief summaries of several cases which were operated upon successfully under regional anesthesia.

J. L. VAN B.

PAPILLARY CARCINOMA OF THE KIDNEY

Date of Admission:—October 22, 1924.
Date of Discharge:—November 18, 1924.

COMPLAINT:—Hematuria. Nothing in history of any importance. Right kidney palpable and movable with some tenderness on deep pressure.

CYSTOSCOPY:—Urea estimation on right side 16 gms. per 1., on the left 17 gms. per 1. Phenolsulphone-phthalein on the right side 1%, on the left side 5%, total amount collected for 10 minutes. The microscopic examination on the right side showed few red blood cells, and occasional epithelium cell, and the left side showed the same.

X-RAY:—There is a big shadow above the pelvis of the right kidney. This shadow is apparently connected with the kidney shadow. There is no evidence of stone.

PYELOGRAM:—Shows a filling defect in the upper calix on the right. At the uretero-pelvic junction there is a right angle kink, and below this there is a narrowing of the ureter, just below the uretero-pelvic junction, and also a narrowing further down.

DIAGNOSIS:—*Tumor of Kidney.* SUGGESTION: —*Nephrectomy.*

OPERATION:—*Right Nephrectomy.* Para Vertebral Anesthesia. Superficial and deep tissues bled freely. Many large veins were found coursing through the fatty capsule over kidney. Kidney was delivered with much difficulty. It was found to have a tumor on its upper pole about the size of a grapefruit. There was much difficulty encountered in placing the clamp on the pedicle. Two double catgut sutures were placed about the pedicle. Cigarette drain placed down to the pedicle. Wound closed in layers.

Patient left Hospital 16 days after operation in apparently perfect physical condition.

PATHOLOGICAL DIAGNOSIS:—*Papillary Carcinoma of Kidney.*

J. F.

URETERAL CALCULUS

Date of Admission:—January 5, 1925.
Date of Discharge:—January 22, 1925.

Patient first entered Hospital for Hypertrophied Prostate, and had a Perineal Prostatectomy. Two years later he was admitted for Hydronephrosis and Abscess of left kidney, for which a Pyelotomy incision and drainage was done under regional anesthesia. It was known at this time, that he had a stone in his left ureter causing obstruction. The kidney being in an acute stage, it was deemed advisable to relieve the Hydronephrosis and Abscess with the hopes of restoring the kidney function. Four months after this, the patient returned to the Hospital with a clean kidney wound, which was draining urine freely, thus showing that the kidney had been restored to function.

At this time the problem was to remove the stone from the ureter, and close the sinus, thus causing the urine to go through its normal channel from the kidney.

Operation:—*Ureterotomy for Stone*—Para Vertebral Anesthesia.

Gibson's golf-stick incision was made down to the Peritoneum. This was stripped back and the ureter exposed. The stone being found, the ureter was opened directly over the stone, and the stone removed. It measured about 1¼ cms. in diameter. The ureteral probe was then passed through the opening downward to the bladder, and upward to the kidney. A drain was placed at the site of the Ureterotomy, and the wound closed in layers.

The patient recovered uneventfully, and walked out of Hospital 34 days after operation with no sinus and with normal function of both kidneys as proven by Cystoscopy.

H. M.

VESICAL DIVERTICULUM—VESICAL CALCULI—SUPRAPUBIC SINUS

Date of Admission:—January 20, 1925.
Date of Discharge:—March 2, 1925.

Patient entered Hospital complaining of supra-pubic sinus, which had been open two years, following operation for bladder stone, at which time no stones were found.

Cystoscopy and Cystogram:—Revealed three diverticulae extending from the posterior wall of bladder, all of which were filled with stones.

Operation:—*Cystotomy and Resection of Diverticulae—Sacral and Parasacral—Local Anesthesia.*

Usual supra-pubic incision was made. Bladder opened along its entire anterior wall. The diverticulae were each resected in toto, and the opening left in the bladder wall, was closed with plain catgut. Bladder was then closed around the suction drainage tube. After two weeks suction drainage tube was removed, and the supra-pubic sinus allowed to close.

Recovery of the patient was uneventful and complete.

After being in Hospital for 50 days, patient walked out in apparent good health. Had complete control of his urine. Was voiding in a normal manner.

J. S. O'D.

ENLARGEMENT OF PROSTATE

Date of Admission:—January 29, 1925.
Date of Discharge:—March 1, 1925.

Patient is a man of 62 years old. Entered Hospital complaining of complete retention for one week, and inability to empty bladder for two years. There is nothing of importance in the history. No abnormal physical findings, except for a large prostate and rales in the apex of the left lung.

Supra-pubic cystotomy was done, and the patient allowed to drain for thirteen days. Then a Perineal Prostatectomy was done under Sacral and Parasacral Anesthesia.

The patient's wounds healed by first intention, his recovery was uneventful, and he walked out of Hospital in apparently perfect health, twenty days after the Perineal Prostatectomy. He was voiding normally, and had complete control of his urine, and was able to completely empty his bladder.

Pathological Diagnosis: — *Hypertrophied Prostate.*

C. P.

PERIURETHRAL SCAR—URETHRAL STRICTURE

Date of Admission:—January 8, 1925.
Date of Discharge:—January 13, 1925.

Patient is an Italian man, 46 years old, fairly well developed. Fifteen years ago, he had stones removed from each kidney. One year ago, he entered Hospital with an impacted stone in the posterior urethra and infiltration of urine in scrotum and perineum, tissues were gangrenous.

A Urethrotomy was done, and the perineum and scrotum incised in numerous places. He recovered from this with a sinus in the posterior urethra, anterior to which there was an impassible stricture. He entered Hospital in this condition with a large area of firm scar tissue in the region of the sinus and stricture.

Operation:—*Resection of Scar Tissue and Urethral Sinus*—Local Anesthesia.

The old scar tissue was resected. No. 18 french rectal tube was inserted through the urethra and anchored in place. Patient left Hospital five days later wearing a retention catheter, to report to out-patient-department for observation.

One month later the sinus was completely closed and No. 26 sound passed easily. At the present the patient is having sounds passed once every two weeks, and has had no trouble with his stricture. He now takes a No. 30F sound without difficulty.

Note:—This patient for past fifteen years, has passed small stones. At present he has stones in both kidneys, but by repeated dilitations, he has been enabled to pass the small ones, and his kidney function is good.

Perhaps at a later date, if the patient agrees, the larger stones will be removed from the kidneys.

It will be seen by observing the accompanying chart that operations have been successfully performed on every organ of the genital and urinary tracts. Certain types of operations are more successful than others. It is noticeable that perineal operations show the largest number of complete successes. This is particularly true of those whose performance does not lead the surgeon out of the mid-line. Very few anesthesias are unsuccessful for the performance of perineal prostatectomy. A far greater number are unsuccessful in operations upon the kidney. This is to be expected. It is entirely possible that it may be necessary ultimately to follow Gwathmey's suggestion, that an ounce or two of ether be introduced into the colon before the administration of paravertebral anesthesia in kidney operations.

It is possible that regional anesthesia may entirely replace all types of general anesthesia for the performance of many operations upon organs of the urinary tract.

MAJOR UROLOGIC OPERATIONS UNDER REGIONAL ANESTHESIA UP TO JUNE 9, 1925

Diagnosis	No. of Cases	Operation	Anesthesia	Results of Anesthesia: Good	Fair	Poor	Post Op. Course: Shock	No Shock	Results: Cured	Imp.	Dead	Average Post. Op. Days
Adenomatous Prostate	130	Perineal Prostatectomy	Sacral and Parasacral	121	9	0	3	127	127	0	3	22.7
Carcinoma Prostate	11	Perineal Prostatectomy	Sacral and Parasacral	4	5	2	0	11	0	10	1	42
Prostatic Abscess	15	Perineal Section	Sacral and Parasacral	15	0	0	0	15	15	0	0	12
Seminal Vesiculitis	7	Seminal Vesiculectomy Perineal	Sacral and Parasacral	3	4	0	0	7	6	1	0	12
Renal Disease	38	Nephrectomy	Paravertebral	25	9	4	0	38	36	2	0	18
Renal Lithiasis	28	Pyelotomy	Paravertebral	15	10	3	0	28	26	0	2	18
Nephroptosis	6	Nephropexy	Paravertebral	4	2	0	0	6	6	0	0	21
Ureteral Lithiasis	2	Ureterotomy	Paravertebral	1	1	0	0	2	2	0	0	18
Urethral Lesions	18	External Internal Urethrotomy	Sacral and Parasacral	18	0	0	0	18	18	0	0	14
Subcervical Group	12	Young's Punch	Sacral and Parasacral	12	0	0	0	12	12	0	0	7
Vesical Lesions	12	Lithalopexy Resection Etc.	Sacral and Suprapubic Infilt.	12	0	0	1	11	11	0	1	5
Total	279			230	40	9	4	275	259	13	7	

A critical comparison of the last one-hundred consecutive cases of prostatectomy performed under general anesthesia with the first one-hundred consecutive cases performed under regional anesthesia, has proven to be most interesting.

On account of the fact that the two series above mentioned were not operated upon under exactly similar conditions the comparison may not be entirely fair.

In the first or inhalation series 66% of the cases were operated upon in the Department of Urology by members of the staff, 44 of the cases were operated upon either in other parts of the Hospital (New York) or other Hospitals. The deaths were divided equally between the two groups being seven in each.

The entire second or Regional anesthesia series was done in the Department of Urology, New York Hospital.

Our impression, gained from daily observation, that there is much less bleeding during and after the operation is fully borne out by the revue of the charts. In the inhalation series, 31 cases had unusual hemorrhages—23 of whom went into shock and 7 died largely due to this depletion of blood—3 of them died without coming out of the shock. Of the second or regional series only 6 had unusual hemorrhage, 3 went into shock and one died within 18 hours after the operation.

The impression gradually increases that people who have unusual hemorrhage do not convalesce well and even if they do not go into shock and die from it, they are subjected to a great many ills and dangers which are not present if they have not lost a great deal of blood at or subsequent to operation.

The post-operative complications other than hemorrhage and shock have been more numerous in the inhalation series, 24 cases had more or less severe complications, 5 of these were infected wounds—four epididymitis. This is of particular interest because there were 3 cases of epididymitis in the other series and no infected wounds. One would naturally assume that there might be some trophic disturbance causing more liability to infection of wounds in the block anesthesia, but such is not the case in this series, most of the wounds heal by primary intention.

The stay in Hospital is lessened by a little over 10 days on the average, a most important indication of the rapidity of convalescence which is more striking in the appearance of the patient himself even than the figures mentioned above.

The mortality rate is more striking than any of the other observations made, 14% in the inhalation series and 3% in the regional group.

A close study of the deaths one has in a series is always most important. In the first series three cases died from the shock of the operation, two on the next day and one on the third day. Four deaths were from uremia on the third, 32nd, 43rd and 72nd days respectively. Two died of pneumonia on the 10th and 15th days. Two of pulmonary embolus one on the third and one on the 30th day. One died on the 16th day having profound shock—autopsy showed multiple abscesses of the kidneys. One died of cardiac collapse on the 14th day post-operative. One case had profound shock at the time of operation but died 40 days later.

In the regional series there were three deaths —No. 76 died of hemorrhage and shock 18 hours after operation. One case No. 75 died of cellulitis of the sacrum 13 days after operation. The third case No. 78 was about to be discharged from the Hospital on the 19th day, and on the morning of his departure, he was straining at stool and died instantly of pulmonary embolism.

CONCLUSIONS

1. Operations upon every organ in the genito urinary system are practicable under regional anesthesia.
2. The supreme advantages are:—
    1. That the patient may take fluids up to, during and immediately after operation.
    2. The blood pressure is not elevated as it is in any type of inhalation anesthesia, or depressed as it is in spinal, therefore there is very little bleeding during the operation.
    3. The anesthesia persists for many hours after administration thereby eliminating pain and frequently rendering the administration of opiates unnecessary as a post-operative procedure.
3. The supreme disadvantage is that what is injected cannot be extracted, therefore it must be given slowly and one must stop at the slightest evidence of toxicity.
4. That great group of lung complications including "ether pneumonia" is eliminated.
5. The convalescence of the patient begins when the last suture is tied and is shortened very considerably.
6. The mortality rate is reduced to a minimum.
7. Regional anesthesia is the work of the professional anesthetist and not of the surgeon.

DISCUSSION

DR. JAMES A. SEAMAN, Springfield: We have listened to a very instructive and edifying paper this morning and I feel somewhat abashed in discussing the subject as Dr. Lowsley has presented it to us. His experience is quite large as you know, while our experience is exceedingly less than this eminent surgeon's from New York. I have had occasion to see a great many of Dr. Lowsley's earlier cases and I have watched them post-operatively and I can attest to the value of results in these cases. The Doctor is rather severe with himself in his statistics especially in his first seventy-five or so where he credits himself with fair and poor results. As he mentioned, the early series was carried out at the Bellevue Hospital where so many of the urological cases that are admitted are hopeless from the beginning, that is they come in with large quantities of residual urine, markedly damaged kidneys, and often are uremic. A number of his cases which he reports as only fair results and a few of them poor results are in this group.

Inspired by Dr. Lowsley's work we have conducted a small series to date which have been very satisfactory from the standpoint of regional anesthesia used. We have done a number of cystoscopies under sacral anesthesia in painful bladders which could not have been done in any other way save with general anesthesia. There were three Young's punches where the anesthesia was perfect. One striking case in our group was that of a large pyo nephrotic, polycystic kidney which had been ruptured in an accident. The patient was about eighty years of age. An operation was done under para-vertebral anesthesia which was effective to the extent that the patient fell asleep on the table during the operation.

Another more recent case, in an elderly man with a large ventral hernia in which omentum and bowel were very adherent throughout the sac, was done successfully under the same anesthesia. The manipulation of the bowel, however, caused some slight discomfort.

To date we are satisfied that regional anesthesia has its place not only in major urological surgery but in general surgery as well. It may not always be 100% perfect but even when it isn't a little bit of ether or gas oxygen as an adjuvant to the anesthesia is much to be preferred to a prolonged general anesthesia especially in cases where the latter is contra-indicated or at least risky. With close attention to the many important details of technique and with perfection in the necessary surgical strategy which must go witht his type of anesthesia there will be more and more cases offered the advantage of surgery without the incident risk, who might otherwise have to forego it.

DR. WILLIAM C. QUINBY, Boston: I can't answer in the vein in which your Secretary has suggested. I do, however, wish to go on record as agreeing entirely with Dr. Lowsley's work though I am only able to make a few points in regard to details other than those which he himself has made.

I disagree a bit in regard to the value of statistics comparing the fatal results of any major operation done under regional anesthesia, paravertebral or what not, with those following the same operation done under a general anesthetic; provided, of course, that in each case the lungs are normal. I feel that the advantage of paravertebral anesthesia or nerve block anesthesia comes mostly from the fact that it compels the surgeon to treat the tissues with respect, rather than that it avoids pulmonary complications. Everyone here who has seen surgical operations under general anesthesia will recall occasional rough handling of tissues. Picture for a moment the appearance of those tissues when examined under the microscope. I think we would be astounded to see how much extravascular hemorrhage occurs, and how much bruising of the tissues. Such conditions doubtless predispose to pulmonary involvement by emboli. In my opinion the advantage that a local anesthesia has—and this shows in the statistics of convalescence as well as in those concerning mortality—comes from the fact that in order to avoid pain we must handle the tissues delicately. Now there is no reason why a surgeon should not operate just as gently under a general as under a local anesthesia. Therefore, the advantage of the local anesthetic as regards pulmonary complications is more seeming than real.

In operations involving organs in the pelvis there is no doubt that the local block anesthesia is very satisfactory indeed; and it is in these cases that I have had experience with this method. Here we are helped by the anatomical relations of the cauda equina and sacral hiatus into which the solution may penetrate with ease. If we add to this blocking of the sacral roots, the anesthesia is complete. Higher along the spine control of the nerve supply as far as the external nerves are concerned can also be complete. Anesthesia, however, of the sympathetic nerve supply, the branches of which run from the general coeliac ganglion around the coeliac axis and along the renal artery, cannot be attained; and while there may be no pain felt from operative interference with these nerves, there is nevertheless a depression of the pulse and a lowering of the blood pressure; a condition similar to that which one sees following a solar plexus blow. So if one must inevitably do a lot of rough handling where perirenal infiltration is present, or where there is a short indurated renal pedicle, I would strongly advocate a general anesthetic; or substitution of a general anesthetic for a regional anesthetic when the operation reaches that stage.

I think Dr. Lowsley is to be congratulated on his results and I am convinced when he analyzes them after further time that he may find them more favorable.

Dr. Oswald S. Lowsley, New York (closing): I am very anxious to hear the discussion on the next paper on the heart because in our particular specialty we are inclined, especially the younger ones of us, to think of these patients as so much phthalein per hour or so much retention or so much urea excretion. The training of the medical student seems to emphasize methods of precision to such an extent that we have educated all the powers of observation out of him. I have been almost mystified by some of the things that my elders could see that I couldn't see at all. It seems to me when we are preparing patients for operation, we must not only consider the laboratory tests but the man as a human being. Therefore if the patient isn't feeling well, if he isn't perfectly fit to proceed with an operation for the removal of his prostate, he should be allowed to go over for a few days until he becomes fit.

I wish to express my appreciation for the discussion of my paper. The opportunity of addressing your society is greatly appreciated.

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PROLAPSE OF THE UTERUS*

BY JOHN M. BIRNIE, M.D., SPRINGFIELD, MASS.

The terms Prolapse and Procidentia when applied to uterine conditions are rather loosely used and some confusion thereby results. In this paper I shall consider the two conditions as merely phases of the same pathology, differing only in extent. The anatomical faults which permit the uterus to begin its descent are the same as those which exist when the descent has become complete. I use the phrase, anatomical faults, because several structures normally contribute to the support of the uterus. Some of these supporting structures also contribute to the support of other organs. As Procidentia is merely the final stage of Prolapse, I shall use the word Prolapse in this paper without regard to the extent of the existing condition.

Prolapse of the uterus is always with us and is about as prevalent today as it was twenty-five years ago. In spite of our advances in obstetrics, the destruction, trauma and relaxation consequent upon child birth has not lessened perceptibly and the resulting conditions will confront us for years to come. To be sure there are cases of Prolapse of the uterus occurring without preceding pregnancy but they are not common and they are characterized by having elongation of the cervix rather than true descent of the uterus. Causation is not important here as we are dealing primarily with treatment, which is the same whatever the etiology.

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It is because of the prevalence of Prolapse, its distressing effect upon the patient, and the difficulty of its satisfactory treatment, that I have undertaken today to discuss the problem and to venture into the field of specialized surgery.

The fact that there are so many different operations advocated for the relief of the condition under discussion probably means that the final operation has yet to be devised. It is perfectly true, that no one operation will be applicable to all cases because of existing complications. By this, I mean, one cannot use an operation which conserves the uterus in a case which obviously demands hysterectomy. In order to further simplify this paper I shall consider only the cases of uncomplicated Prolapse, if one may use such a term. In a very general way the operative measures for the relief of Prolapse may be classified under two main headings: abdominal operations and vaginal operations, and under the latter, a subheading, interposition operations. The advocates of these different methods of attacking the problem are rather emphatic in their statements and after reading numerous articles the surgeon of limited experience is in somewhat of a quandary as to how he should proceed with his own few cases. Graves says: "Vaginal operations, in general, are less efficacious than those of the abdominal type. The best operations now used can be divided into two classes—those that employ the interposition principle and those that depend on artificial suspension from the abdomen," and states that he favors the latter principle. (*Gynocology* by W. P. Graves.) Bevan is very emphatic in his condemnation of any procedure which "plasters the uterus foreward" and further says "No surgeon has a right to perform an operation for fixation of the uterus that carries with it the danger that developed in these three cases." (*S., G. and O.*, Feb., 1925.)

Miller of New Orleans says, "Failures that follow the various suspension operations and even the firm fixation of the fundus of the uterus to the abdominal wall." He goes on to say, "Interposition operation will result in a higher percentage of satisfactory results than any other operation so far devised for the relief of uterine Prolapse" and he gives the cures as 95%. (*S., G. and O.*, March, 1924.) Hirst and Mazer (*A. J. of C. and G.*, March, 1923) say, "It is a grave mistake to perform either abdominal or vaginal hysterectomy as a cure for Prolapse. We cannot too strongly insist that no abdominal work is necessary for the care of Prolapse of the uterus. No operative interference other than properly performed, extensive vaginal work is needed."

I do not believe that such dogmatic statements are justifiable in considering a surgical problem. End results are the final test and if two surgeons using very different means can procure the same results with the same safeguarding and comfort of the patient, they can have no quarrel. It is because of this possibility of attaining good results by different means that I wish to present today a method of treating Prolapse of the uterus which in our hands has proved satisfactory, a method which while not new, has not attained the prominence which it deserves. I refer to vaginal shortening of the broad ligaments combined with repair of the utero-pubic facial plane.

Crossen says of this procedure, "This is an operation of much promise because it deals directly with the cardinal supporting structures of the uterus. When the strong portion of the broad ligament of each side is adequately shortened, a most important step has been taken toward permanent correction of the Prolapse." (Crossen, *Operative Gyn.*)

The female pelvis is crossed by two diaphrams of fibromuscular tissue which offer the main support of the pelvic organs, and they are arranged one above the other. The lower diaphram is made up principally of the levator ani muscles with their facial sheaths (recto-vesicle and-anal). In every operation advocated for the relief of Prolapse of the uterus whether it be by abdominal or vaginal approach, an attempt to repair this lower diaphram is made by performing a perineorraphy and I shall not consider this step further, but do wish to emphasize its necessity and importance most strongly. The upper pelvic diaphram is composed of two organs, the uterus and bladder, with their supporting structures which consist of the broad ligaments, utero-sacral ligaments, utero-pubic facial plane and fibres connecting these structures. The lower portions of the broad ligaments attached to the cervix are composed principally of connective tissue and are so important that they have been named the "cardinal ligaments" of the uterus.

All of the vaginal operations and some of the abdominal operations take cognisance of these "cardinal ligaments" and attempt to use their strength in curing Prolapse. Also most operators attempt to use the utero-pubic facial plane either directly in their operation or indirectly by performing an anterior colporrhaphy.

In attempting to cure Prolapse by vaginal shortening of the broad ligaments, the first step is to perform any necessary work upon the cervix such as repair of lacerations or amputation. The latter operation is of frequent necessity as the cervix is usually elongated and may simulate marked Prolapse when in truth the fundus of the uterus is but little below its normal plain. This condition coupled with the cystocele which accompanies it demands the complete operation.

In the operation proper a transverse incision is made through the mucous membrane over the cervix extending well around to the sides and below the cystocele. If an amputation of the cervix has been done the above described incision may be a part of the amputation incision. Beginning in the median line, a second incision is made at right angles to the first one and carried upwards almost to the meatus. This incision is carried through the mucous membrane and underlying tissue (utero-pubic facial plane) down to the bladder. The triangular flaps resulting on either side of the second incision are dissected free from the bladder either as one or two layers as the operator prefers. The exposed bladder is now separated from the cervix and broad ligaments well up to the uterus, the higher the better. Next the lower portion of the broad ligaments are freed. One is now ready to shorten the ligaments and it may be done in three different ways as suggested by the three men who brought out this operation, working independently. Hertzler severs the lower portions of the ligaments from the uterus and overlaps them in front of the cervix suturing them to each other and to the cervix. Dudley severs the ligaments in the same way and sutures them together instead of overlapping them. Alexandroff does not cut the ligaments at all, but joins them together and to the front of the cervix by sutures, introduced into the ligaments isolated by the surgeon's finger. This latter method is the one which we prefer. The sutures are placed high in the ligaments and low in the cervix so that when tied, they tend to draw the cervix upward and backward. The backward placement of the cervix is, of course, a most important point as it forces the uterus to resume very nearly, if not actually, its normal position. This step having been accomplished, we next deal with the utero-pubic facial plane which was prepared in the first step of the operation. The redundant portions of the triangular flaps first made are trimmed off so that they will just meet in the median line without undue tension and they are then sutured together and to the underlying uterus and broad ligaments further supporting the uterus and completely obliterating the cystocele by holding the bladder well up.

In the five years ending January 1, 1925, there have been performed at the Springfield Hospital, 97 operations for Prolapse of the uterus divided as follows:

Vaginal Hysterectomy	9
Abdominal Hysterectomy	1
Round Ligament Suspension	6
Interposition operation	4
Abdominal fixation	1
Vaginal Shortening of the Broad Ligaments	76

These figures show that while nearly all the types of operations have been used, the preference is strongly in favor of Vaginal Shortening of the Broad Ligaments. While no exact follow up has been made of these cases, yet most of them have been examined at intervals subsequent to operation and the results are highly satisfactory.

There is no shock to this procedure and these patients have very little discomfort and no pain following the operation and they seldom have to be catherized. In view of this, vaginal shortening of the broad ligaments, seems to me, to be a conservative measure in elderly, obese women, below par as most of these patients are. It can be undertaken in cases where one would hesitate to do extensive abdominal work and the time consumed is much shorter than is required to do a combined vaginal and abdominal operation. We have used it in diabetic cases properly prepared by medical supervision without any difficulty. The procedure is used without regard to the age of the patient as the question of future pregnancies does not influence us in any way. In the treatment as outlined, nothing is done which is incompatible with child bearing and one is not forced, as with some other operations, to sterilize the patient. If one hesitates to use a general anesthetic because of the patient's condition, parasacral, sacral anesthesia is perfectly feasible as has been proven in our series.

While I do not claim that every case can be cured by the means I advocate, yet, I do know that many women suffering from complete Procidentia, with a large mass protruding from the vulva, have been restored to a comfortable existence and have been able to resume heavy and tiring occupations.

DISCUSSION

DR. R. P. WATKINS, Worcester: This is a subject in which I have been much interested for a great many years and is, as has been said, a very important one. Dr. Birnie has covered this particular form of treatment in a very adequate way, and I have nothing to say in regard to that except that I believe thoroughly that no one operation will cure all of these cases, as he has said. If this particular operation has been more successful in his hands than any other one, that certainly is the one for him to use whenever it is possible.

The problem as it presents itself is purely a problem in mechanics. To get at the fundamentals of it, one must know the mechanics of the situation. The method of the production of prolapse we all know, but I should like to call one factor in it more clearly to your attention. The first occurrence in prolapse is a retroversion, not in every case of prolapse following a laceration of the supports, but in practically all. There is one factor in the production of retroversion which is an important one and which was called to my attention thirty years ago by Dr. W. Gill Wiley of New York, and that is the pull from below. You have, of course, primarily a laceration or relaxation of the perineum. The normal direction of the rectum is first downward and forward, so that the feces coming down the rectum impinge on the posterior wall of the vagina close to the perineal supports. Then the rectum turns backward at a sharp angle for an inch and a half. The function of the levator ani muscle is to straighten out the canal, to lift up the anus and obliterate that angle so that the feces will pass straight through the anus. Now, if the feces continue to impinge against the posterior vaginal wall as they will if the levator ani has lost its function, it causes a pull on the posterior part of the cervix which has a tendency to tip the uterus backward. That is the first step. Then, of course, you get pressure from above, exerted on a uterus in a position to slide easily down the inclined plane below, the stretching out of the other supports, and so on, to a more or less complete prolapse.

Therefore, as Dr. Birnie has said, the most important thing to do is to restore the function of the levator ani.

Practically all the operations on the perineum today are efficient. The old ones were not. Emmet's operation at first was a mere reefing of the mucous membrane, but today it is more than that. In this connection there is a point which is frequently lost sight of in some of the operations on the perineum, and that is—it is important not to shorten the posterior vaginal wall. Any operation that does that tends, in some measure, to vitiate your results for the same reason that the pulling on the posterior wall by the feces impinging on it causes a retroversion.

The other factors in the production of a prolapse have to be taken into account in correcting this condition, so that we must do all we find necessary to do to correct all the forces that have applied to produce the prolapse in the particular case on which we are working. Dr. Birnie said: "The fact that there are so many operations shows that we have yet to find the right one." One reason for so many operations is that there are so many conditions to combat. No two cases are exactly alike. The man who knows the mechanics of the thing that he must do; who knows the material he has to work with, both in the normal state and the state in which he finds it, and has sufficient mechanical knowledge and ability to restore conditions with the material at hand, is the man who will be successful in operating on these cases; and he will use the operation which applies best to the conditions at hand. If he is more familiar with one operation, well and good, but he will not always do that operation in the same way. He will modify the operation to suit the case, and to get the best results, he will, at times, be compelled even to do some other type of operation.

A Member: I have been very much interested in the paper and in the discussion. It seems to me the mechanics of the production of the prolapse of the uterus hasn't been made clear. In my experience there have been two types of cases in which prolapse occurs; first, the patient who has had a high, mid-forceps done, a primipara or multipara, where the cervix hasn't been completely dilated by the natural forces and where it has been necessary to interfere before the head has come through the cervix. If you follow your obstetrical cases from the beginning to the end of the labor, you will notice that the cervix slides back over the head as the head comes down. Now in such cases which are becoming more frequent it is becoming necessary to interfere because of pain, it is necessary often times to complete dilatation manually or to apply forceps when the cervix isn't fully dilated before the cervix has slipped back over the head. In these cases the pelvic fascia and that part of the fascia which forms the broad ligament become stretched out, and these cases are apt to be followed by a prolapse. In a surprizing number of cases we have no laceration of the perineum and we are much chagrined to find two months afterward that the patient has a cystocele and a prolapse. That is perhaps the less common of the two types in which you get prolapse.

The other type is that in which the woman has had a number of children in rapid succession and has gotten up before the tissues have had time to regain their tone, and the uterus has come down.

Now in regard to the treatment, the large number of operations which have been devised and advised for this condition shows that the treatment is unsatisfactory. There is only one operation in my experience which has given universally satisfactory results in all cases, and that is the Watkins interposition operation. Of course, that is limited to patients at or immediately after the menopause before the uterus is atrophied. In the patients who are beyond the child bearing period or who can (not) be sterilized at the time of operation so that no future pregnancies are possible this operation is not without danger. There is a slight mortality, and unfortunately in my experience I have lost one patient. I have had no failures, however. I think I am correct in that statement though I can't give you the correct figures. On the other hand, patients during the child bearing period who cannot or should not be sterilized one must seek some other method. These methods are all unsatisfactory, but where the Watkins operation is contra-indicated they all have to be done.

Dr. Dudley Carleton, Springfield: I think the vaginal shortening and repair has been very satisfactory. The one case he mentioned as having a suspensory operation I believe I did, and I would like to say that I think it is the only thing to be done in cases after the menopause in old people with complete prolapse of the vaginal vault and what is left of the uterus. I do not believe a hysterectomy is proper. I believe that a fixation is the only thing to do. This case was that of a woman 82 years old. The vault of the vagina and cervix were eroded and reached almost to her knees. The patient could not sit up; a fixation was done, and she is alive after five years.

Dr. John M. Birnie, Springfield (closing): I realized, gentlemen, that this subject is one on which you can get a discussion at any time. Everyone differs in his ideas as to the mechanics of the production of prolapse, and consequently everyone differs in his method of procedure. Dr. Watkins spoke about retroversion and the pull from below. I think that pull from below is very important and accounts for a great deal. As to retroversion I don't take much stock in that. Nine out of ten women have their uterus tipped backward. These women have never had any symptoms, and I doubt very much whether retropositions in themselves without complications have much to do with the production of prolapse.

As to prolapse without tears that is an interesting point, and we all know they can occur. This particular operation works nicely in these cases. It is an interesting point that as you go over the literature, no matter what operation a man advocates, his second choice is an interposition operation. If a man can't do a vaginal repair operation, then he advocates an interposition operation; and a man who advocates abdominal work, if he can't do that, then he advocates an interposition; and that is the operation on which most men agree and concentrate.

THE SANATORIUM TREATMENT OF JUVENILE TUBERCULOSIS[*]

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The multiplicity and the scope of the various methods in use today for combating tuberculosis are so great and so broad as to be quite beyond any estimation or measure. These methods have been developed from a myriad of divergent or analagous reasons, ranging all the way from the wildest empiricisms to the utmost in exacting scientific researches. During the past several decades when organized campaigns against the disease have been conceived and developed there has been happily a definite lowering of the tuberculosis death rate. An assertion to the effect that these organized campaigns have been and are entirely responsible for this mortality reduction would not only be inaccurate, but dangerous. Dangerous, because the resulting satisfaction might easily lull us into a complacency which should not tincture our present or future attitude towards tuberculosis.

That to certain parts or phases of these campaigns unstinted credit must be given is not to be denied, and it must also be granted that much may still be expected of them in our efforts toward eradication of the disease caused by Koch's bacillus.

Not the least important of these has been, and is, the searching study of the tubercle bacillus, its life history, its disease producing power, its versatiity, its relations to other bacteria, its chemical constituents and properties. In short, too much importance can not be ascribed to the knowledge that may be gained as the result of prolonged and rigid scientific research of b. tuberculosis. And it will be by pursuit of these investigations that the organism will be more accurately and intimately understood and the means for its extinction be the more readily found.

Affording the same valuable possibility of knowledge, and of like importance, must be considered the searching investigations and researches concerning the human body and the body functions, and the study of the varied and many body reactions to the bacillus tuberculosis. Only in this manner will full understanding ever be gained of the meaning, of the alleviation, of the prevention of the devastating effects of this organism upon living tissue.

A third exceedingly important part of our organized campaigns has been and is the educational feature. Through this influence phthisiophobia has been abated very materially, and with its abatement the institution of anti-tuberculous treatment has become immeasureably easier. Dissemination of definite knowledge about general health, and tuberculosis in particular, has very possibly been responsible for the diagnosis of more and more early or arrestible cases. With no chance to assert with accuracy, it still may be assumed, however, that such education may have played more than a minor part in prevention of the disease, and it surely must be true that arrested cases of tuberculosis have by this widespread information and training become aware of certain principles that have been of assistance to them in maintaining that state of health.

Many schemes and plans in our organized campaigns have utilized all of these procedures; several have used two and a few have embraced all three. One of the latter vehicles has been and is the sanatorium plan, which gives searching attention to the tubercle bacillus, its effect upon the human body, and disseminates to patients and to patient contacts, general health and tuberculosis education.

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[*] Read before the Section of Tuberculosis at the 144th anniversary of the Massachusetts Medical Society at Boston, June 9. 1925.

The sanatorium is of course only one part of the great campaign, but because it participates in the three offensives mentioned its activities are always of definite and significant interest. The sanatorium has not proved to be the panacea for tuberculosis, as some would have described it a few years since, but it is fairly well understood that the pessimism sometimes expressed as to the value of sanatorium treatment is mainly due to the fact that during the inception of the movement expectations of results were too broad and extravagant.

This leads us very naturally to the query: What then may be expected of sanatoria? Before answering this let us first dispel some of the mists of illusion. For some reason many of us who are in favor of sanatorium treatment have had difficulty in relinquishing the idea that there is a sort of magic in the environment of sanatoria—a magic that will bring back to robust life the third stage consumptive, or make a new man of the early, minimal lesioned patient as well, and in almost equal numbers. With all fair mindedness we should concede that the miraculous improvement of the apparently hopeless, advanced-stage case on the sanatorium porch is only one of the freakish vagaries of the disease and that very possibly he would have been improved anwhere else in ordinarily good environment and with ordinarily good care. Likewise if we are open minded when we are ascribing to any particular mode of treatment a high rating of virtue and efficacy, we must remember that this estimation of its great value should be leavened by the fact that the vast maority of cases of tuberculosis manifest a strong tendency to recover under any method of treatment, or even spontaneously.

Having eliminated from the question miraculous improvements and spontaneous recoveries it is still possible to assert that we may reasonably expect much of sanatoria. If the cases admitted are of the amenable types, high percentages of improvements should result when the standard routine is maintained. The admission of far advanced hopelessly diseased patients to sanatoria is being less and less practiced. It is recognized that such patients need the same attentive bedside care that all exceedingly ill cases with unfavorable prognoses need, and that that type of attention is more readily given in tuberculosis hospitals, or tuberculosis wards of general hospitals rather than in sanatoria. In this way, it is believed, the special sanatorium treatment and education will be more wisely applied, more to those patients capable of improvement, and the results obtained will be more satisfactory, more widespread, and more permanent.

Since they embrace the three principles mentioned of study of the germ, study of the disease produced by the germ, and dissemination of the results of these studies, sanatoria have very naturally been included in plans and campaigns initiated as a result of the universal interest and increasing attention being given to tuberculosis among children. It is not too much to hope that these methods employed in children's sanatoria will be responsible for evolving some of the great truths about tuberculosis that have thus far been withheld or overlooked.

In the meantime, with methods of diagnosis becoming more and more refined we are confronted with the very definite need for the establishment of a policy of treatment for juvenile tuberculosis. And since conservative estimators assure us that 80% of our children under the age of 14 have been infected with the germ of tuberculosis, and yet only a comparatively small part of this number have become sufficiently ill with the disease as to warrant any undue attention, it follows that we must have very clearly in mind the types of cases that are to receive actual treatment.

Obviously a distinction is necessary, and just as it is reasonable to attempt to exclude far advanced, hopeless, adult consumptives from sanatoria, so also is it reasonable to attempt to exclude from children's sanatoria all those who are not afflicted with active tuberculosis.

Preventorium work, observation and care of tuberculosis contacts, treatment of undernourished children, and other like procedures are far better carried out in preventoria, open air schools, nutritional clinics, or similar organizations, so that children's sanatoria may be permitted to admit and care exclusively for children with active tuberculosis; that is, children who actually present some evidences of constitutional toxemia resulting from the active infection.

Some such plan is necessary, else a very large part of our child population may be candidates for sanatoria. It is not to be presumed that this is a covert assertion implying that all active tuberculosis in children must or should be treated in children's sanatoria. Such a statement would be absurd and far from the meaning we intend to convey, which is, briefly, to the effect that sanatorium treatment is one of the easiest methods for supplying the required treatment for tuberculosis to large groups of children, and gives results that are twofold: namely, alleviation of disease, and anti-tuberculosis education.

Home care, day camp treatment, hospital treatment, clinic routine, open air schools, all have their parts in combating and alleviating childhood tuberculosis, and all have certain very definite advantages for certain cases. As one of the assets in our fight against the disease the sanatorium likewise has certain advantages, and as we are principally concerned in this paper with the sanatorium treatment we may recite these as follows:

1. Possibility of accuracy of classification for treatment. That is, only the active cases are cared for; the latent and inactive cases are discharged to home, clinic, or school supervision.

2. Ease of individual treatment in conjunction with group management. In other words, although the sanatorium is felt to be an institution for group treatment, the very fact that it is prepared for any form of treatment makes it easier to care for needs of the individual patient more easily than could be done in the home without upsetting the household.

3. Coördination of treatment with continuance of education. Ordinarily the child undergoing treatment elsewhere will miss important parts of his schooling; whereas, this problem is cared for at the sanatorium by shaping into the program a definite plan of education and instruction.

4. Therapeutic discipline. The child in the sanatorium is not coddled, yet no attempt is made to institutionalize him or to restrain him from personal initiative. He is simply taught to take his treatment methodically, when so often elsewhere sick or ailing children are permitted to follow therapeutic routine at their own discretion, solely because they are sick and ailing.

5. The applications of special methods of treatment may be better carried out in a sanatorium than elsewhere because of the continual state of preparation for such measures and because the patients may be more closely observed before, during and after the administration of such treatments. This is especially true in artificial pneumothorax, postural rest, treatment by roentgen, clinical, electrical and solar rays, and tuberculin treatment.

6. The dietary, a most important part of the plan, can be scientifically devised and yet maintain tastiness and attractiveness. Likewise it very frequently supplies ample food of the proper nature to children who are habitually underfed or improperly fed at home.

All types of active tuberculosis of childhood may be treated in sanatoria; pulmonary adult type, pulmonary juvenile type, bone, glandular, skin, abdominal and others of the less frequently encountered varieties. In a general way the treatment of all is similar; certainly the fundamentals are identical: fresh air, good food, proper rest, and sunlight. Medicinal therapeusis occupies no higher level of importance in children's sanatoria than in those devoted to adults. It is certainly not to be denied that there are many more remedial agencies annoying and painful symptoms of the disease which hasten recovery by alleviating the most and which contribute much toward the prevention of complications, but their efficiency is most notable when used in conjunction with the four principles already mentioned. Medications and other special treatments are most effectively administered symptomatically, and are to be selected with a view to the particular needs and requirements of the individual patient.

We have as yet no tuberculosis specific; no serum or vaccine capable of producing consistent cures. The discovery of tuberculin gave to the waiting world a brief period of high hope that the dreaded disease was soon to be controlled and exterminated. But it is now thirty odd years since tuberculin was first produced, and in spite of the hordes of workers who have used it in a myriad of different forms, yet only in sporadic instances can it be conceded that tuberculin has been the remedial agent responsible for recovery or cure. It is true that investigators continue to concern themselves with some form of the substance—the Deycke-Much partigens, Maragliano's serum, the tuberclomucin of Weliminsky and the recently reported and much discussed Dryer. faccine and a host of other modifications of the product, or unusual procedure for obtaining tuberculin, all testify that interest has not been lost in this particular lead. Yet we must be optimistic indeed if we grant that tuberculin in any form is doing more than alleviating some cases of tuberculous eye conditions, an occasional glandular tuberculosis and once in awhile a skin affection or some other form of tuberculosis.

And so it is with the scores and scores of other professedly infallible remedies that have been brought forward from time to time. A brief period of more or less circumscribed enthusiasm, followed soon after by apethetic interest and finally sincere disbelief in new cures has taught us to embrace more closely the routine methods that have been in use for so long.

These methods are so familiar to all that any mention of them must be more or less banal, but since we are engaged in a discussion of the treatment of juvenile tuberculosis and since these old methods make up our most dependable armamentarium, whether used in sanatorium, hospital, clinic or home, we, therefore, find it necessary to touch upon them, at least.

The gospel of fresh air is so thoroughly preached these days and times that what was once regarded as the spectacular in the sanatorium routine, is now of only casual interest. Beds on open porches, winter and summer, rest outside in fresh invigorating air, school and all of the casual routine of the day in the same open atmosphere, are of equal importance in children's sanatoria. The value of this routine in such an institution cannot be exaggerated since it gives early in life practical experience with a habit that is certainly conducive to the promotion and maintenance of health and if followed in later life will probably contribute in no small measure towards reasonably constant hardihood.

The "good food" portion of anti-tuberculosis routine has run the gamut of experimentation almost as completely as has the medicinal treatment of the disease. Most sanatorium authorities are now fully convinced that these institutions are not proper places for conducting nutritional experiments and are including in their menus simple but attractive, tasty and well cooked dishes using in their preparation only the best of staple foods. The old gorging method, of "feed a fever" fame has long since been relegated to limbo, for too rapid weight gaining in tuberculosis patients often permits a short cut to a poor prognosis, and wise ingestion of food is more likely to be followed by good digestion, than which there are few more favorable signs observed in improving sanatorium patients. Somewhat careful individual attention is required in children's sanatoria, for the children must often be taught how to eat, and quite frequently what to eat. For these patients are quite prone not only to capricious appetites, but also to positive dislike for simple foods that properly they should eat. The problem of training a child to partake of and enjoy a large variety of simple healthful foods is not always easy, but it is of the utmost importance when that child is suffering with active tuberculosis.

Rest, or rather rest and exercise, are deserving of the most searching attention when considering the treatment of juvenile tuberculosis The benefits to be derived from this routine are infinite, but it is far easier to prescribe rest for a child than it is to fill the prescription. Many tuberculous children have never been taught to take rest during the daylight hours, and likewise movies, radio and street light games have not made the bedtime hour for children any earlier. There must be included in the sanatorium methods then an inflexible rest routine, and the little patients must be taught to observe this routine as methodically as possible. Exercise for the improving and good prognosis cases is just as important as rest, and the patients who have reached such a status should receive graduated exercise, walks, or be permitted to play non fatiguing games, always in the outdoors and always under the watchful eye of playground instructors or nurses who are familiar with their physical conditions and limitations. Exercise for other patients whose conditions are not so favorable should usually be walking or light exercise to an extent prescribed for the individual patients.

Any signs of progressive disease, or complications such as temperature of 100, hemoptysis, pain, persistent cough, constant failure to gain weight, swelling or fluctuation around the diseased areas are all indications for absolute rest in bed.

Natural rest or general rest is of benefit in all forms of tuberculosis when systematically carried out, and there are certain forms of the disease in which, in addition, there is indicated artificial, or localized rest. Minimizing the general activities of patients of course reduces the functional activity of the diseased parts, but more than this is necessary for such specific conditions as one sided, progressive pulmonary lesions, or active tuberculous disease of bones or joints.

For the former, postural rest sometimes gives good results. Rest in bed, with the patient lying on the affected side will reduce the respiratory excursion of that side and will cause the other lung to do the greater share of work, and will permit the diseased lung to lag sufficiently, in some instances, as to permit healing. Acting upon the same principle, but more direct in their application, and probably more beneficial in their results are such apparatus as binders, adhesive strappings, pleurisy jackets or corsets and chest splints. These all aim to minimize as much as possible the actual physical labor incident to the act of respiration in the diseased lung. Postural drainage is of definite benefit in active tuberculosis of the lungs where copious quantities of sputum are present, and likewise where there is some difficulty in performing the pulmonary toilet, and espelially so where small dilated pockets or bronchiectatic areas have developed around the lesion. The patient is extended, head down on an inclined plane at an angle of about 45 degrees for a half hour, night and morning, or longer if required, during which time a large part of the residual sputum is drained out, and the cough for the succeeding several hours is thereby markedly relieved.

In the category of artificial or localized rest there also may be included mention of artificial pneumothorax. Just as mechanical appliances give more accurate means of applying rest externally than postural rest, so also does the injection of air or gas into the pleura cavity function more effectively than the external mechanical appliances. For the gas or air will by compression surely put at rest the diseased area. Progressive and active tuberculosis of one lung in children is not of tremendously frequent occurrence, but it occurs quite sufficiently often for us to have this means of treatment in mind. Children suffering with severe toxemia as a result of the active disease in one lung may many times be greatly improved and their lives lengthened by the use of artificial pneumothorax. It is a measure that is capable of giving most gratifying results also in cases of pulmonary hemorrhage that have been unrelieved by other methods of treamtent. Conservative estimation of artificial pneumothorax convinces us that it has an important place in our list of remedies for pulmonary tuberculosis and indeed we now recognize that nature not infrequently, by means of pneumothorax, hydro-pneumothorax of serous pleuritic effusions puts at rest diseased lungs for a sufficient length of time as to permit the disease focus to become quiescent. Therefore, so long as there is little or no pain, and a comparatively small amount of respiratory interference the best attitude to assume toward such incidents in the course of pulmonary tuberculosis, is, probably, watchful waiting. Certainly the removal of such natural splint by means of aspiration is to be delayed so long as the life of the patient is not actually endangered.

A further development in localized rest for a lung, or rather complete and permanent rest is exemplified by the thorocoplastic operations now being performed by some. This, the surgical treatment of pulmonary tuberculosis, is usually accomplished by removing portions of the ribs of the affected side. This permits a total collapse of the lung. Its success with pulmonary tuberculosis in children has not been reported upon but it remains as a possibility when on account of adhesions or other impediments it has been impossible to establish collapse by means of artificial pneumothorax.

Bone and arthritic tuberculosis must likewise receive the most careful artificial or localized rest. In tuberculosis of the hip, of the spine, of the knee, of the elbow or other bones, complete rest of the affected part must be established, and in children, must be enforced by the use of orthopedic apparatus, with the limb or part in slightly exaggerated position, to prevent deformity. And this must be continued perhaps in varying modifications throughout the period of active disease. And unless this rest is carefully planned and systematically maintained the patient, under the routine, efficacious administration of the other principles of treatment, may recover from the active disease, it is true, but all too often with a useless limb or a distorted body.

The kinds of apparatus, splints, plaster casts, braces, and so forth, are relatively unimportant so long as they meet two requirements; first, correct individualization for the particular patient and his particular disease; and second, assured absolute rest of the part in proper orthopedic position.

The essential point is that with children suffering with bone tuberculosis, it is absolutely necessary in conjunction with the other standard routine methods to maintain as far as possible physiologic rest of the diseased area, and in most instances then satisfactory results may within reason be expected. In this connection recent visitors at Leysin have returned fully convinced that Rollier is as insistent upon the absolute rest of his actively diseased orthopedic patients as he is upon the sun cure for them.

Fortunately but few children present evidences or symptoms of laryngeal tuberculosis. For such as do, it hardly need be said that along with the other routine methods a program of silence, or absolute and prolonged rest of the vocal cords should be maintained.

Fourth in the list of routine methods adaptable for use in children's sanatoria is heliotherapy, or sun cure, probably equal to, or perhaps greater in importance than any other single factor in the treatment scheme. Certainly its application is not the least sensational, nor are its results lacking sometimes in the spectacular. Although this procedure was of ancient inception and practice, yet we are but now beginning to rend the veil which has hitherto obscured the real truths concerning its efficiency and means of activity. As a recent editorial in the *Journal of the American Medical Association* express it: "The Greeks had their helioses, and the Romans their solaria; yet heliotherapy has as yet scarcely emerged from the most empiric of performances into the dignity of a scientifically justified or rationalized procedure."

This statement is in truth unassailable. However, the wonderful results obtained by Rollier in Switzerand and other workers abroad, and more recently by individuals and institutions in this country with the use of heliotherapy, have convinced most authorities that while the application of this treatment may be empirical for a shorter or longer time to come, this is relatively unimportant so long as the careful and systematic continuance of its use is rewarded with the favorable results being obtained.

For approximately the past ten years heliotherapy has been included as a part of the routine for all cases of bone or glandular tuberculosis admitted to Connecticut State Sanatoria. Since the establishment of two institutions for children about six years ago the procedure has become as much a part of the scheme of treatment as rest or fresh air. Bone, glandular, abdominal and skin tuberculosis receive sun cure steadily as do also selected cases of pulmonary types. Introduction to the treatment is, with all cases, accomplished very gradually. It is necessary in the first place to estimate the degree of tolerance of the patient and for this purpose gradual progression and strict individualization are necessary. As the violence of a reaction to the sun's rays is largely dependent on the distance of the lesion from the insolated part of the body surface, it is natural to begin with the exposure of the extremity the greatest distance from the lesion, and it is then gradually extended until the entire body is being exposed.

We continue to use the graduated method of progressive insolation as planned by Rollier as follows:

1st Day—Feet, five minutes.
2nd Day—Feet, ten minutes; legs, five minutes.
3rd Day—Feet, fifteen minutes; legs, ten minutes; thighs, five minutes.

4th Day—Feet, twenty minutes; legs, fifteen minutes; thighs, ten minutes; abdomen, five minutes.
5th Day—Feet, twenty-five minutes; legs, twenty minutes; thighs, fifteen minutes; abdomen, ten minutes; chest, ten minutes.
6th Day—Feet, thirty minutes; legs, twenty-five minutes; thighs, twenty minutes; abdomen, fifteen minutes; chest, ten minutes; back, five minutes.

This is increased on the same scale until the patient is able to withstand two hours' exposure of the whole body each day. This two hour exposure is given while the patient is at rest, but during the entire day the child is clothed only in short trunks so that he is constantly being bathed in the sun's rays. This dress is worn during the Spring, Summer and Fall; ordniary clothes are worn in winter except during the two hour period devoted to sun cure when the trunks, shoes and gloves and hat constitute the costume.

Our standard routine at the Meriden Sanatorium makes all patients subject to routine general heliotherapy except in the presence of hyperpyrexia or during acute inter-current illnesses. Localized heliotherapy, or the application of sunlight to a specific lesion or a certain part of the body is not practiced. The treatment is not discontinued on dull days, for it has been observed by certain authorities that more of the ultra violet rays, even on sunny days, come from the sky as a whole than directly from the sun.

Ultra violet lamps are being used by many in lieu of sunlight. Having had no experience with such apparatus we are not in position to affirm or deny claims or counter-claims concerning their use. Most tuberculosis workers, however, seem inclined to the opinion that so long as natural sunlight is obtainable its application is the procedure of choice.

Patients with tuberculous bone lesions very nearly always may be introduced to heliotherapy after the gradual fashion described, with no reaction or untoward results. Those with glandular lesions but seldom evidence the pallor weakness, dizziness, vomiting or temperature which would demand a cessation of the exposure. Likewise, those with tuberculous peritonitis usually become quickly accustomed to the routine and begin to improve rapidly. Unfortunately, the same may not be said of cases of the pulmonary types. The true juvenile type of pulmonary tuberculosis where there is no definite involvement of the lung parenchyma will in the majority of instances respond favorably to the action of the sunlight, but the patient who has definite lung disease, and in whom there may be discerned signs of constitutional toxemia resulting from the active invasion of the disease, must be placed upon the treatment most cautiously and must be removed from it as soon as the slightest signs of improper reactions are observed. Temperature of 100, hemoptysis, vomiting, dizziness, extreme pallor, or slight cyanosis are danger signs not to be disregarded. The reactivation or exacerbation of the disease in quiescent, or mildly active cases, following large or carelessly regulated doses of sunlight, is a possibility not to be overlooked or forgotten.

In our hands pulmonary tuberculosis of the juvenile type has in the main responded in a highly satisfactory manner to treatment by sun exposure. Our children afflicted with more extensive disease, or adult type, have in a certain number of instances been materially benefitted by the procedure—some remarkably so. Recent reports inform us of the success of other workers using sunlight for treating both children and adults in whom the disease was of the adult or parenchymal type. Notwithstanding this, however, it must be granted that for the present, at least, sunlight is showing its greatest efficiency and giving more generally satisfactory results in the treatment of bone, glandular and abdominal tuberculosis than with other forms of the disease.

Tuberculosis of bone need no longer cause the horrible pain and anguish for little sufferers, nor need it be followed by the terrible distortions and deformities once so well known. Early diagnosis with the X-ray, and early heliotherapy in conjunction with localized rest by means of some of our present day, highly specialized and individualized orthopedic appliances will reduce to a minimum either of those occurrences.

The former high mortality of tuberculous peritonitis is reducing steadily because of the decreasing tendency for operative procedure and the increasing tendency for the application of sunlight therapy instead.

Glandular tuberculosis is likewise being combated most successfully with heliotherapy. The comparatively rapid amelioration of the condition by its use; the infrequency of development of sinuses, or the consequential scars; and the relatively prompt and permanent subsidence are three accomplishments that have convinced us that at the present time it is our most satisfactory remedial agent aaginst tuberculous adenitis.

Briefly described then, these are the four fundamentals upon which the sanatorium treatment of juvenile tuberculosis is based: fresh air, good food, rest and sunlight. Their routine application in such an institution not only promotes a large number of recoveries from active tuberculosis but instills in the minds of the children so treated the simple but important facts about general health and its maintenance. The habits of rest and exercise, cleanliness, personal hygiene, and open air life are not easily forgotten; and the adherence to such habits after discharge from the sanatorium may reasonably be expected to contribute in a certain degree towards increased resistance against re-infection and re-activation.

The following brief description of the routine management of patients admitted to the Meriden Sanatorium for children will suffice to describe how these four fundamentals are utilized:

All new patients are admitted into a Reception Ward where they remain for three weeks. This prevents the dissemination of any contagious diseases to which the children may have been exposed before admission. This period likewise permits the gradual introduction of the youngsters to the open air and sun cure phases of the treatment, and begins the formation of their sanatorium habits or health education. It is, of course, obvious that open air treatment should be instituted as carefully as heliotherapy, for there are many children who have never slept in a room with the windows even partially open, and nothing is to be gained by too sudden or too great changes.

While the child is in the Reception Ward he undergoes the most rigid observation so that he and his disease may be understood as definitely as possible. Thorough medical investigations are carried out by means of searching physical examinations, routine and special laboratory procedure, tuberculin testing, X-ray examinations, nose, throat and dental surveys and treatments. In this manner, it is possible to eliminate promptly from the sanatorium such cases as may be suffering with some disease other than tuberculosis. Likewise, this emphasizes for treatment any allied conditions that may be present, such as diseased tonsils, oral sepsis, otitis or other such conditions that may be more or less responsible for the non-improvement of the tuberculous lesion or general condition.

By the time his stay in this ward is completed then a comparatively definite diagnosis has been made, a fairly accurate prognosis arrived at, and likewise the general trend of his treatment has been decided.

The Infirmary is the next step in the plan. Here are domiciled all cases with progressive disease, all orthopedic cases requiring frequent orthopedic attention, all cases that because of symptoms or conditions require individualization of rest and exercise, food, heliotherapy or special treatment.

As the patients improve in general condition, and as their disease becomes less active, they are transferred to convalescent wards where diet, exercise, and sun cure is less restricted, and where only casual symptomatic treatment is required in addition to the routine methods. Patients in these buildings who develop intercurrent diseases are transferred to, and treated in the Infirmary.

The ambulatory patients arise at 7:00, breakfast at 7:30, attend school from 8:30 until 12:00 in the sanatorium open-air schools, have dinner at 12:30, and from 1:30 until 3:30 take the sun cure at rest. From this time until 5:00 they play at various games under the direction of a playground supervisor who is familar with the physical conditions of all. Supper is at 5:30, and from 6:00 until 7:30 ensues another play period; and at 8:30 they retire for the night on open porches—open, yet fuly protected from inclement weather.

Constant observation by means of T. P. R. records, weighing, X-ray, and physical examinations, provides definite knowledge of the progress of the child. When all signs of constitutional toxemia resulting from his disease have disappeared and remained absent for several months, longer or shorter, depending upon the amount of involvement, the child is discharged from the sanatorium. The average stay of our children is about eleven months.

The question of applying other methods in conjunction with the general plan of treatment of course presents itself occasionally. Complications arise that demand more specific therapeusis. Non-improvement of certain cases with the routine plan is sometimes observed. It also becomes desirable and justifiable upon occasion to investigate the reported efficacy of other means or methods.

A few examples of these will be cited. As has already been intimated, exceedingly careful attention is given to the dental conditions of these patients and all abnormalities are corrected as far as possible. The elimination of oral sepsis not infrequently throws the balance sufficiently in the patient's favor as to permit him an unimpeded recovery from his tuberculous infection.

The same in general may be said of diseased tonsils. Often close observation will convince us that recurring attacks of tonsillitis happen with sufficient frequency and virulency as to overcome any gain the patient may make between attacks. For such children tonsillectomy is either performed at the institution or recommended for prompt attention elsewhere.

Heliotherapy that is followed by no pigmentation or tanning has been observed by some to be of no benefit to types of tuberculosis ordinarily amenable to this treatment. This has in our own experience been true. The administration of the tincture of the chloride of iron, or painting with a weak solution of tincture of iodine, in conjunction with sunlight exposure will often be followed by pigmentation and improvement.

Spontaneous pneumothorax occurs not infrequently in children with adult type lesions. For this distressing complication little relief except that offered by opiates can be expected. Hydropneumothorax and serous pleuritic effusions require but seldom any treatment and most often will do more good than harm if let alone.

The majority of cases of tuberculous adenitis in children will respond favorably to the use of heliotherapy. Some authorities are of the opinion that surgery is of greater importance. We are of the belief that surgery in competent and conservative hands is applicable to a small percentage of cases, after standard non-surgical procedures have failed, and in such cases where the removal of tuberculous glands is of more importance than the possible development of a paralysis.

Considerable attention has been given of late to the X-ray treatment of this condition. Apparently it has not yet been established on a sufficiently definite basis as to warrant conclusions, but reports would seem to indicate bright and favorable prospects, and further investigations of its use by unbiased observers should render informative and interesting data.

The aspiration of suppurating glands followed by the injection of various chemotherapeutic agencies has not, in our hands, given any more satisfactory results than simple aspiration to prevent breaking down, performed in conjunction with heliotherapy.

It is unnecessary to discuss treatment of the various accidents and complications that may develop in children suffering with juvenile tuberculosis, for as has already been said concerning the symptomatic administration of medications and special treatments, these occurrences are to be met with a view to the particular needs and requirements of the individual patient and his individual condition.

The foregoing, then, is what today comprises the sanatorium treatment of tuberculosis in children. In it there is nothing new—for confessedly we have nothing new to offer—certainly nothing revolutionary. Rather is it hoped that a continuance of these systems and methods will be responsible for the development of knowledge and ideas that are evolutionary.

For, unquestionably, children's sanatoria will give us ample opportunity for the close observation of the development of a disease, the original infection of which occurs in 80% of children before they have reached the age of 14.

It likewise gives us advantageous means for alleviating or impeding the progress of certain forms of the disease that occur so frequently in childhood, and at the same time gives us the opportunity to establish in young minds sound ideas of health education and disease prevention.

May we not hope, in the absence of statistics on the subject, that such treatment of early and comparatively benign disease during childhood, in coördination with the period of practical health instruction, will be responsible for the development of a smaller amount of lethal tuberculosis in later adult life?

DISCUSSION

Dr. Edward O. Otis, Boston: I want to congratulate Dr. Gibson as well as ourselves for his admirable paper. Of course, it did not come within the scope of Dr. Gibson's paper to consider all the forms of tuberculosis in children. One may say that there are three forms of tuberculosis found in children: one, the most common, to which Dr. Gibson has referred, is the so-called "hilum tuberculosis," and this form as Dr. Hunt has well said in one of his papers, requires only rest, good food and fresh air; and most of those cases recover. The next form is the adult form in the parenchymia of the lungs found in children. In my experience that is rare. It is acute and generally becomes fatal in a short time. On the other hand, it occasionally becomes chronic, and we may have as a third form a chronic tuberculosis in a child, sometimes invading a whole lung with cavities and yet the child looks and feels in good condition, but yet there is the danger that acute symptoms may occur with breaking down and a fatal result follow.

Those are the three essential forms of tuberculosis in children; and, of course, the adult forms are to be treated just as we treat adult cases.

I want to say a word with regard to the value of a sanatorium, and that, it seems to me, depends largely on two things: one is education and the other is training, and that is a hard thing to do. As someone has said, "it requires brains to get well from tuberculosis," and that is true; and as Dr. Brown put it—"it depends more on what is above the collar than what is below whether a man gets well or not." Now it is true that tuberculosis can be treated at home, but it requires care and attention and enthusiasm on the part of the physician in order to bring this about. In the first place you have got to train the family to appreciate what is being done. You have got to turn the home into a sanatorium, and that is a difficult thing to do. The physician himself does not always appreciate the importance of training the family as well as getting the coöperation of the patient himself, but that is the only way in which home treatment can be successful—namely in training the patient and educating the family and in constant watching and in intelligent control of the patient. Home treatment is possible but home treatment is harder than sanatorium treatment. But there again in the sanatorium we must have a medical supervision which will insist upon discipline and training and will educate the patient, because no sanatorium completes the cure of its patients, it simply puts them on the road to cure, it trains them, it educates them; and then they have got to complete the cure, if they have the will power and the intelligence, themselves.

With regard to the effect of sunlight I have been often asked whether that is of value in pulmonary tuberculosis. Well, I think we have no sufficient evidence to show that it has proved valuable. DaGrasso in his sanatorium in New York State has tried it and has reported his results, but these as yet seem inconclusive. Another point is to be impressed upon those who attempt heliotherapy in pulmonary tuberclosis as well as in bone and joint tuberculosis and that is that the sunlight may be dangerous if not rightly applied. It has to be begun very carefully, as Dr. Gibson said, beginning with the extremities and going up until the whole body is exposed to the sunlight. I have a patient who has pulmonary tuberculosis, and who thought the way to do was to expose her chest every day for an hour or more to the sunlight. Now that is the wrong way, and may produce evil results. The right way is to begin with the extremities for a short time, five minutes, and then going up until the whole body has been exposed.

The results of heliotherapy in bone and joint disease are marvellous. Anybody who visits Dr. DaGrasso's sanatorium will be astounded at the results he has obtained. I recall the case of a diseased wrist joint so disorganized that anybody would have said that the only thing to do was to amputate it, and yet through heliotherapy recovery with only a small amount of ankylosis took place. Heliotherapy in bone and joint tuberchlosis and also in peritoneal tuberculosis is producing wonderful results, but it has to be carefully and scientifically applied.

Dr. Olin S. Pettingill, Middleton, Mass.: I wish to congratulate Dr. Gibson on the thorough manner in which he covered the field and on the way in which he presented the subject. I would like to add a word of caution in regard to applying heliotherapy to the pulmonary type of tuberculosis. I have seen several cases which have been overdone with apparent disastrous results, especially in hot weather. I have in mind a man who was sent to Atlantic City. He told me he used to stagger out on the beach and lie on the sand until he was hardly able to get back, and instead of improving the disease, it resulted in active tuberculosis. It wasn't done on the order of any physician but from what he had seen in the popular press.

The application of the sun's rays in most of our sanatoria is not done as thoroughly as it is done in Dr. DaGrasso's sanatorium near Buffalo, but we are coming to use it more and more and especially in the tuberculous complications that arise.

As for the Alpine lamps, we use these at the Essex County Sanatorium, but our results haven't been alarming or conclusive in any way. We have one case of laryngeal tuberculosis which it has apparently helped; but there too it raises the question whether with absolute rest the patient wouldn't have been the same without the lamp treatment.

I am thoroughly convinced that the greatest field which now faces us is the juvenile problem and I think as medical men we can't take too much interest in this work not only in our cities but in the rural communities where we see a lack of the common hygienic factors which might be instituted in our small schools.

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REMARKS PRESENTED BEFORE THE MASSACHUSETTS MEDICAL SOCIETY RELATING TO THE STUDY OF CANCER*

BY G. H. BIGELOW, M.D.

Dr. E. H. Bigelow: The Legislature in a Resolve appropriated money for the study of cancer.

Dr. G. H. Bigelow, Boston: This study is in response to a legislative resolve directing the Departments of Public Welfare and Public Health, jointly, to study cancer throughout the Commonwealth, with special reference to the inoperables, and if the care is inadequate to suggest methods of improving the same. The Legislature is generous in the range of its studies. The Committee that has been appointed consists of John H. Nichols, M. D., Superintendent at Tewksbury, as chairman, together with Merrill E. Champion, M.D., F. W. Goodhue and G. H. Bigelow, M.D. Dr. Nichols has asked me to bring this matter to your attention. In cancer considerable is known about deaths, but comparatively little about morbidity, and, of course, that is what we ought to know in order to estimate the care of the inoperable. We are approaching all the doctors, all the hospitals, and all the overseers of the poor in the Commonwealth, as well as every other source where we can obtain information. It seems that no study, where the time is limited, can be made without resort to a questionnaire; and we are going to send a questionnaire to the 6,000 doctors in the state. We intend to make it brief and we want you to resist the impulse to throw them into the waste basket. In case you cannot answer the questions, turn over the sheet and write your comments. We want information especially about the small "homes" where a nurse is willing to take care of one or two cases. These "homes" are not registered, and we have no way of knowing the number of these or the cost. We request your coöperation in this study and any information you can give us. Letters should be sent to the State Department of Public Health at the State House.

On July first, 1925, the following letter and questionnaire have been sent to Doctors throughout the state:

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*Read before the afternoon session, Tuesday, June 9, 1925.

Department of Public Health,
State House, Boston.

Dear Sir:

In compliance with a Legislative Resolve, we are investigating cancer with special reference to the needs of the "inoperables" and the extent to which these needs are being met. There are many figures on deaths from cancer, practically none on cases. We must get these as well as information on available beds for "inoperables"; the volume of "inoperables" that cannot be adequately cared for at home; the average stay in a hospital of terminal cases; and (which is perhaps the most important) if resources for the "inoperables" are found to be inadequate can this be most effectively remedied by extending diagnostic and therapeutic service to the end that the volume of "inoperables" will be reduced to within the limits of present resources, or is this too theoretical and should more beds for terminal cases be made immediately available? To answer this we must have information as to the adequacy and extent of present diagnostic and therapeutic services.

For this information we are approaching all the doctors, hospitals and overseers of the poor throughout the state with a questionnaire. We realize that personal interviews would be more profitable but this is out of the question. Also there are certain of the questions you may be unable to answer. Of course, omit them. We feel that the most fruitful part will be the additional facts and opinions which we hope you will give on the back of the sheet. We enclose a return envelope.

Let us thank you in advance for your help in this baffling and pressing matter.

Yours truly,
John H. Nichols, M.D., *Chairman*,
Merrill E. Champion, M.D.,
F. W. Goodhue,
George H. Bigelow, M.D., *Secretary*,
Committee for Departments of
Public Health & Public Welfare.

COMMONWEALTH OF MASSACHUSETTS

Questionnaire on Cancer to Private Physicians

1. How many cases of cancer have you attended in private practice from January through to May, 1925?
2. How many of these cancer cases do or will need hospitalization in the terminal stages? Where will they get it?
3. Have you found difficulty in obtaining institutional care for these cases? If so, in how many instances and how were the cases cared for?
4. Do you know of boarding places* for such cases?
   If so, name and address:
5. How many can be cared for at their own homes?
6. What of the following diagnostic services for cancer cases are accessible to you and where?
   A. For pay patients
      a. Consultation
      b. X-ray
      c. Pathological examination
   B. For indigents
      a. Consultation
      b. X-ray
      c. Pathological examination
7. Where is your operative work done?
8. Have you ready access to X-ray and radium therapy? Where?
9. What other forms of treatment do you use?
10. What is the average time that patients have symptoms before coming to you?
    In your opinion is this interval greater or less than ten years ago?
    How many cases become inoperable through consulting cults or non-medical agencies?

Name ____________________
Address ____________________

*This includes private homes, etc., where chronic cases are boarded.

(Please use reverse side of sheet for additional information.)

ORIGINAL ARTICLES

THE OCCURRENCE OF SMALLPOX IN THE UNITED STATES AND MEASURES TAKEN BY THE FEDERAL GOVERNMENT FOR ITS CONTROL*

BY W. F. DRAPER, M. D.
Assistant Surgeon-General, U. S. Public Health Service

For many centuries before the discovery of vaccination, smallpox was as wellnigh unversal as measles and whooping cough are today; probably more nearly so. In those days, one death out of every ten on an average was due to smallpox, and of the living, four out of every five were pitted by the disease.

Smallpox was introduced into America coincident with its settlement and has been present in this country ever since. It is not my purpose, nor is it practicable to trace its history from the early days. It is well, however to review briefly the incidence of smallpox in the United States during the last quarter of a century and to consider those outbreaks occurring in the last few years which have been attended by a high mortality.

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*Read at the meeting of the Massachusetts Association of Boards of Health, July 30, 1925.

I regret that it is impossible to present to you a comprehensive picture of smallpox as it has existed in the United States, since say, the year 1900. When we attempt to go back even that far into the history of the disease, we find that reports are very incomplete. There are many cities, and some States that have excellent reports beginning long before that date. There are many more that have failed to keep such records until more recent years.

In 1900, the official registration area of the United States for deaths included only ten States representing 40.5 per cent of our population. At the present time, there are thirty-nine States in the registration area and including eighteen cities not in registration States, these represent 88.4 per cent of our population. For this reason, the data here given pictures conditions only as they existed at the time reports were made and only in those States that were reporting at the time.

For the five-year period, 1900-1904 inclusive, the annual death rate from smallpox in the then registration area varied from 1.9 in 1900 to 6.6 in 1902, the highest year for that five-year period. Perhaps it would mean more to you, if I said that a death rate of 1.9 per 100,000 today would mean 2,090 deaths anually in the United States, and the rate of 6.6 would mean 7,260 deaths per year estimating our population at one hundred and ten millions.

For the eighteen years, 1905 to 1922 inclusive, the death rate from smallpox in our registration area ranged from 0.2 per 100,000 to 0.9 per 100,000. For 1923, the death rate from smallpox was 0.1 per 100,000, the lowest rate we have ever had in so far as I am able to determine. The figures for 1924 are not yet completed but the rate will certainly be higher.

When we compute case rates, we find that our data are even much more incomplete than are the data for deaths. In general, it may be said that for the last twelve years, annual case rates for smallpox in the States reporting have ranged between 23 per 100,000 in 1916 to 100 per 100,000 in 1920 and 1921. If these rates prevailed in the non-reporting States (the latter were probably higher) this means from 25,000 to 106,000 cases of smallpox every year.

The history of smallpox in certain cities during recent years shows us what smallpox can still do when vaccination is neglected.

Permit me to read to you the following data concerning outbreaks in cities:

Kansas City, Kansas.—1921

Cases	243
Deaths	15
Deaths per 100 cases	6.2

Kansas City, Missouri.—Aug. 28, 1921 to May 20, 1922.

Cases	509
Deaths	214
Deaths per 100 cases	42.0

Denver, Colorado.—Nov. 1, 1921 to Nov. 30, 1922.

Cases	854
Deaths	263
Deaths per 100 cases	30.8

Toledo, Ohio.—1924.

Cases	559
Deaths	31
Deaths per 100 cases	5.5

Detroit, Michigan.—April 13, to Aug. 31, 1924.

Cases	784
Deaths	139
Deaths per 100 cases	17.7

Duluth, Minnesota.—January to August 1924.

Cases	54
Deaths	15
Deaths per 100 cases	27.8

Minneapolis, Minnesota.—June to December 1924.

Cases	860
Deaths	219
Deaths per 100 cases	25.5

St. Paul, Minnesota.—August to December 1924.

Cases	197
Deaths	13
Deaths per 100 cases	6.6

When we compare the foregoing figures with conditions as they should be, we consider these rates high, because practically every death from smallpox and practically every case of the disease could be prevented by vaccination and revaccination, but when we compare these rates with pre-vaccination days they seem insignificant.

Take Boston for example—In the year 1751, smallpox was introduced by a ship from Barbados. At that time, Boston had a population of 15,684. Of that number, 5,998 had previously had smallpox. During the epidemic which followed, 5,545 persons contracted the disease in the usual manner by exposure and 2,124 contracted it by inoculation; one thousand eight hundred forty-three persons fled from the town to avoid infection. This leaves 174 persons in Boston at that time who apparently escaped an attack of smallpox.

The Public Health Service points with pride to the State of Massachusetts as an example of the way smallpox can be controlled and we believe you do it by vaccination and we hope you will keep up the good work.

A comparison of the smallpox situation during a five-year period in three States which do not differ greatly in number of inhabitants, shows what can be done to prevent this disease.

Smallpox Cases Reported by Massachusetts, Michigan, and California, during a Five-Year Period.

Year	*Massachusetts*	*Michigan*	*California*
1919	40	2460	2002
1920	29	4845	4486
1921	37	4537	5581
1922	2	1231	2129
1923	6	2311	2025
TOTAL	114	15384	16223

Perhaps you might ask me to explain the wide variance between the high and low death rates noted in the data I have presented.

Clinical observation by experienced observers over long periods of time indicate that whenever vaccination is practiced persistently but not perfectly in a given community, two things happen, namely: first, there is a marked reduction in the incidence of smallpox and second, there develops or there may be imported a mild form of the disease, and such mild form becoming well differentiated from the virulent type, and still finding unprotected or partially protected persons to attack, retains its benign character for a number of years. It is also believed that this milder type, or perhaps we should say these milder types, exist independent of vaccination, but that any mild strain, if it spreads rapidly through a poorly protected population, may, at any time, assume a virulence comparable to, and be indistinguishable from, the severest forms of the disease.

It is thoroughly proven that a mild attack of smallpox will protect against all types of the disease. In so far as our observations go, it seems well established that in the United States the outbreaks of virulent smallpox are more often due to the importation of a case or cases of the severer type, rather than a reversion of the mild type, but the persistent occurrence of cases of mild smallpox in any community means that that community is not well vaccinated and augurs that sooner or later (usually sooner) it is due for an outbreak of the fatal type of smallpox.

Health officers are often asked to compare the incidence of smallpox as it is found to occur in "unvaccinated," "poorly vaccinated" and "well vaccinated" countries or communities. The trouble with such comparisons is, that it usually takes an epidemic of smallpox to enable us to find out just what the status of a given country or community is with regard to the proportion of the population who are vaccinated and the number who are not, or at least, who have not been vaccinated for many years. We have almost no records except in a very few instances of the proportion of the population that are vaccinated.

Let us suppose it possible to vaccinate successfully every man, woman and child in the United States, in one day, and having vaccinated them, we stop vaccinating. At our present rate of increase, there would be approximately 12,000,000 unvaccinated children within five years and you could have a pretty severe epidemic of smallpox among 12,000,000 children. In ten years, there would be 25,000,000 unvaccinated children, and of those persons who had been vaccinated at the beginning of the ten-year period, probably one-fourth would have lost some or all of the immunity they once had, so that you can readily see that if people are lax in vaccination, it does not take long to grow or develop a non-immune population,—and that is what frequently happens in what were once fairly well protected countries or communities.

Let us take two examples of countries which the anti-vaccinists are fond of citing—Japan and the Philippine Islands.

You will hear it said that Japan and the Philippines were two of the best vaccinated countries in the world, and that, notwithstanding, both experienced severe epidemics of smallpox.

Dr. T. Amako, Director of the Municipal Hospital for Infectious Diseases at Kobe, writing immediately after the epidemic, which the anti-vaccinists quote, says: "In 1885, the first imperial vaccination law was passed and since then, the former murderous epidemics of smallpox have been tremendously lessened through vaccination."

In reporting the studies of the epidemics under consideration, Dr. Amako states that "Of 3,485 patients whom he observed and in whom he noted the relation between vaccination and smallpox, 45.8 per cent of the unvaccinated died. Of the vaccinated, 7.2 per cent died. I may add that if these latter had been recently vaccinated, as they probably were not, all would probably have escaped the disease.

Prior to the advent of the American occupation, the annual toll of smallpox for many years in the Philippine Islands had been practically the same as the toll quoted by the anti-vaccinists for the epidemic years 1918 and 1919. But from 1900 up to the present time, due to vaccination, if we may except 1918 and 1919, the deaths from smallpox in the Philippine Islands have been few in number, sometimes less than 100 a year. In the reports of the Director of Health for the Philippines, from which the anti-vaccinists quote, you will find in the years immediately preceding the epidemic, warning after warning that vaccinations were not successful, that a non-immune population was developing, that mild cases of smallpox were occurring indicating a loss of immunity and an ever increasing unvaccinated population, and finally, when the severe epidemic did come,—that is the epidemic which was about as severe as the ones experienced in pre-vaccination years, whom did it strike? It smote the unvaccinated and those who had not been vaccinated for many years. It is strange that the anti-vaccinists could not see these statements in these reports.

Now, after the alleged failure of vaccination in Japan,—did the Japanese organize anti-vaccination societies? They did not. They made an investigation and concluded that the ones who suffered in the epidemic years were those who were not protected by vaccination and they made their vaccination laws stronger than ever. What was the result? During the seven-year period from 1909 to 1915 inclusive, Japan reported 1,012 cases of smallpox with 226 deaths. I have been unable to obtain the figures for 1916, 1917 and 1918 but from 1919 to 1923 inclusive, Japan had 10,664 cases of smallpox as against our 322,050 cases during the same five-year period.

The epidemic of smallpox in the Philippine Islands in 1918 and 1919 caused the Philippine authorities to renew their efforts at vaccination with the result that the death rate has again been reduced to an insignificant figure.

Inasmuch as no country and no community in the world, of any size, is ever completely vaccinated, we can not make accurate observation with regard to the efficacy of vaccination by merely saying that the town of Milledgeville for example, is a fairly well vaccinated town, having a population of 100,000 people and that during a certain year there were 6,000 cases of smallpox in that town. What should we do? Let us investigate and find out who in the town of Milledgeville suffered from smallpox. If we find that the vaccinated and the unvaccinated suffered in equal numbers, we are justified in concluding that vaccination afforded no protection, but if we find that it was the unvaccinated,—or those vaccinated many years ago, who were attacked,—then, we are justified in concluding that vaccination does afford protection.

Since Jan. 1, 1921, the Public Health Service has obtained through the coöperation of State and local health officers, the histories of 120,501 persons who have had smallpox. Of this number 110,075 or 91.35 per cent had never been vaccinated; 6,610 or 5.48 per cent had not been vaccinated for more than seven years. This leaves only about 3 per cent who had been vaccinated within seven years.

Smallpox appearing in any community first selects the unvaccinated; secondly, those who have not been vaccinated for a number of years. It leaves those who have been recently successfully vaccinated severely alone.

What is the future of smallpox in the United States? The answer to this question depends on the will of the sovereign people—If the people prefer vaccination and revaccination to smallpox, there will be little or no smallpox; if they prefer to have smallpox rather than get vaccinated, then there will be smallpox a-plenty.

The part taken by the Federal Government in preventing the spread of smallpox in the United States begins at ports of embarcation in foreign lands where those destined for our shores and coming from regions where smallpox prevails in epidemic form, or who have been exposed to smallpox, are required to be vaccinated before embarcation unless there is evidence that they have been successfully vaccinated within a year or that they have had a previous attack of the disease.

Should smallpox occur on board ship while at sea those showing symptoms are immediately isolated and the entire personnel of the vessel is vaccinated.

When a vessel arrives at a port of the United States with smallpox on board or having had smallpox on board during the voyage, the following measures are prescribed:

1. The sick shall be removed to a Federal Quarantine Station and detained until recovered.
2. All persons who in the opinion of the quarantine officer have been exposed to the infection shall be vaccinated, unless protected by a previous attack of smallpox, and detained in quarantine until the vaccination is protective against said exposure, or, if they refuse vaccination detained in quarantine for 14 days after last exposure to the infection.
3. Those persons that have not been exposed to the infection may be released.
4. All personal effects of passengers and crew that have been exposed to infection shall be disinfected. All compartments that have been exposed to the liability of infection shall be disinfected.

PREVENTION OF THE INTERSTATE SPREAD OF SMALLPOX

In general, towns, counties and municipalities have authority to make their own ordinances and regulations for the control of communicable diseases and the manner in which they deal with this matter is determined by their own governing bodies. However, as soon as a communicable disease spreads from one of these jurisdictions or from any other location to other places in the State it becomes the duty of the State Board of Health to institute such control measures as may be necessary.

The authority of the State Board of Health naturally stops at the State line but Congress has made legal provision whereby the United States Public Health Service may coöperate with and aid State and local boards of health in the prevention of the interstate spread of disease and has authorized the Secretary of the Treasury to promulgate such rules and regulations as in his judgment may be necessary to prevent the interstate spread of a disease and to employ inspectors and other persons to enforce these rules and regulations.

In these days of rapid transit both by common carriers and private automobile the presence of a dangerous communicable disease is a matter of vital interest not only to adjoining towns and neighboring States but to the entire United States and to a lesser extent to the entire world. Dependence is placed upon the Public Health Service by the various States and by foreign countries to keep them informed of the occurrence of dangerous communicable diseases and to insure the adequacy of the measures taken to prevent their spread. In the case of serious outbreaks of smallpox it is customary for the State and local authorities to call upon the Service for assistance in its control and eradication. Such a request usually results in the detail of one or more medical officers who support the local authorities in their work and assist in the formulation and execution of measures for control and eradication.

About this time one year ago the increasing menace of smallpox became so apparent that the Public Health Service sent a letter to each State Health Officer setting forth the unusual prevalence of the disease in many of our States and cities during the winter of 1923-1924 in many instances of a virulent type. Copies of this letter were used as inclosures by many of the State Health Officers in letters which they sent to local health officers throughout the States to encourage vaccination to prevent the development of smallpox in epidemic form. A letter was also sent to the American Automobile Association urging that publicity be given through the motor journals to the necessity for all automobile tourists to protect themselves by vaccination. The response to these warnings was hearty and general and much good was accomplished.

THE CONTENT OF THE PRODUCTION OF VACCINATION

Authority for federal control of vaccine virus is conferred on the Secretary of the Treasury by the act of July 1, 1902, which is known as the Biologics law.

This act and the regulations prepared under its authority provide certain measures particularly pertaining to smallpox vaccine. This product may be prepared only by licensed establishments and under conditions of equipment and sanitary surroundings indicated by the Surgeon General of the Public Health Service. All animals intended for the propagation of vaccine virus must be shown to be free from tuberculosis, and such animals must undergo quarantine for a sufficient period to show freedom from other diseases. At the beginning and end of the quarantine period all animals must be thoroughly scrubbed with soap and water. The surface to be vaccinated is rendered as nearly surgically clean as possible, and during the period that the virus is being propagated as many attendants as are necessary are in constant attendance in the vaccine stables to insure scrupulous cleanliness.

After harvesting the pulp each animal is autopsied and any communicable disease other than vaccinia precludes the use of the virus from the animal so affected.

All virus is subjected to a period of "ripening" under the action of phenol and glycerin, in order that the finished product may contain not more than 50 *non pathogenic* organisms per vaccination.

Special tests, cultural and biological, are made on each batch to establish the absence of organisms of tetanus.

Potency tests, by cutaneous inoculations on rabbits are made in comparison with a lot of known high potency, to establish the relative potency of a given lot. These tests are made in dilutions of 1:1000, 1:3000 and 1:10,000.

Vaccine virus may only be distributed in glass containers.

To insure the carrying out of the foregoing, regular inspections of vaccine establishments are made by an officer of the Public Health Service, who personally inspects each step of the manufacture of the product. In addition samples of the product are collected by the inspector, and at intervals from the open market and subjected to tests for purity, safety and potency.

An expiration date of 3 months only is given the product, dating from the time of leaving the establishment, and only if kept below 5°C. (41°F.). This latter proviso is very important as some batches will lose potency if exposed to room temperature for one week. In practically all instances where complaint of lack of potency is encountered the explanation may be found in the storage temperature while on the market. *Therefore, buy in small quantities, and more frequently.*

A product which gives good takes on rabbits will continue to do so for at least 2 years if kept sufficiently cold.

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The Department of Health of Porto Rico has just announced the establishment of a monthly periodical known as the "Porto Rico Health Review." The first issue contains articles describing the work of the Department in combating hookworm, tuberculosis, plague and venereal diseases.

THE IMPORTANCE OF EARLY TREATMENT IN PULMONARY TUBERCULOSIS

BY MARK H. JORESS, M.D., RUTLAND, MASS.

THERE is perhaps no other serious disease so curable as tuberculosis, if treated early; and few more fatal if allowed to progress. The cost of tuberculosis in the family is enormous; statistics have placed the charge each year upon the people of the United States between three hundred million and one and a half billion dollars.

A high percentage of those who die are in the most useful period of life, between the ages of eighteen and thirty-six,—the great period of social and economic contribution. The economic aspects of tuberculosis are obvious; but let us not forget its heavy cost in happiness and life itself. When it appears it carries with it suffering, sorrow and depression.

In treating the tuberculous patient the most important thing is intelligent guidance, of which the most important phase is early treatment. The burden of this responsibility rests primarily with the general practitioner, and only secondarily with the tuberculosis specialist.

Now, then, if one of our clientele has presented himself for a consultation and we have made a diagnosis of tuberculosis, the question will arise as to what to do with him. The man's entire future may depend upon the outcome of this very consultation. The physician oftentimes feels that it will be too shocking to tell him the truth. As a matter of fact, there are very few tuberculous patients who do not recover from the shock a little more rapidly than is desirable. It is at this time that the physician can solve a great problem. A frank talk concerning the disease and its treatment will encourage confidence and instil hope. We hope that the outlook is good if the disease is treated early. There is perhaps no other disease in which the importance of early discovery and treatment is as great.

It is well known that the lay mind still associates tuberculosis with emaciation and death. The word "sanatorium" is still pronounced in a whisper. He often exclaims, "Oh, but I would die if I went among so many sick people!" He does not know the functions of a sanatorium; that it is a place to check the spread of infection and to help arrest the disease; that it is a school for health with a regular course of lectures which deal not only with tuberculosis but with health in general.

As to the financial asspects of the problem, the prospects of a long period of unemployment will urge the tuberculous to keep on with his daily grind. As a matter of fact each day's delay spells progression of the disease. If he is the breadwinner of the family, it is better that the members of his household do without him for a year or even longer than have him become a danger of infection and a financial encumbrance for an indefinite period. There is provision for his case in many sanatoria if unable to meet the expense himself.

If we encourage sanatorium fears, if we hesitate to outline a definite plan for combatting the disease, if we are satisfied to make a diagnosis without prescribing immediate treatment, lives will be lost that would otherwise be saved. This is the time, and the only time, to fight a mighty and relentless foe. Many a physician will hint as strongly as he deems wise that his patient has the disease, but a patient is very slow to take a hint. In the words of one author, "One has to hammer it in with a sledge hammer before many a patient will consent to follow the treatment."

When we explain the results of our examination, give definite advice, and place the patient in a sanatorium, we are treating tuberculosis as it should be treated. The sanatorium is the first and not the last place to which we should send our patients. It is just as easy definitely to state the case, just as easy to tell him that he has consumption and that to obtain a cure immediate treatment and instructions on how to live are imperative.

When we are satisfied to tell him that he has a "spot on the lung," that he has "pleurisy," or simply tell him to "go home and go to bed," we are not treating tuberculosis as it should be treated. If we are using half-way measures in managing these cases, we are doing an injustice to the patient and to society as a whole; for pleurisy is at best a war cloud and is generally a symptom of underlying tuberculous disease. As for saying that a patient has a "spot on the lung," it means no more than that to the layman.

Most likely the physician will say, "Lay off work until you feel better." He might also say, "Go to the country and rest." Either of these prescriptions spells delay. In the majority of instances he is left to his own resources. He does not understand the significance of fatigue; diet he knows very little about; rest, the most important factor in the entire treatment, means to the patient no more than a vacation. When the average layman is told to "lay off work," it means just that and no more to him.

If there is active disease, there should be absolute or nearly absolute rest in bed 24 hours out of 24 hours. Such things as theatre, entertainments, parties, and late hours are contraindicated.

In most cases the prescribed "lay off" or vacation means a waste of time. The leave of absence will have ended and he returns to his occupation. He will probably feel rested, and may show some of his former "pep," but usually this does not last long. We soon learn that he is unable to cope with the daily grind, and in a very short time he will fall out of the race. Some of the former symptoms will return and the beginning or the close of a day's work will find him fagged out.

It can be seen, therefore, that the advice given was only to bring about a temporary improvement, and the consumptive is lulled into a false sense of security.

To bring about a recovery, treatment of the disease must be placed on a rational basis consisting of a definite routine, whether that be done at home, if feasible, or at the sanatorium. It must be borne in mind that the sanatorium functions not so much in curing the disease as in educating the patient how to live.

As for sending our patients to the country, it may be said that they may do well. However, the benefit derived is usually temporary because they have no supervision or instruction how to live. With the great majority of our patients it may be the first prolonged stay from the city. When he is sent to the country with little or no instructions at all, the man with active tuberculosis leads his life as he sees fit. He may remember the recipe to eat plenty of "milk and eggs," but having no knoweldge of dietetics he will invariably suffer from indigestion and malassimilation. Having gone to bed at a late hour and up at an early hour for many years, it will probably appeal to his fancy to lounge in his bed all morning. A late breakfast will be the first breach of a good dietetic regime. After breakfast he will likely take a walk. Should the country chosen be mountainous he will probably come back fatigued, and is not likely to enjoy his dinner. Again, remembering that he came to the country to "build up" he will invariably take a hike in the afternoon. Now, if he already suffers from fatigue, the latter will increase and when he returns he will be too tired to eat his supper. He may go without this meal, or at best, gulp down a milk shake or two. If he has gone to the country in the winter, his outdoor life will be limited and he will probably spend the evenings indoors. In these days of easy travelling the automobile will bring him to a roadhouse where he can spend an evening or two each week eating and dancing.

It is evident that the time spent in the country will mean an irregular life with its lack of rest, malnutrition, and very little fresh air. Therefore, the very essentials for successful treatment will be most neglected, and nothing worth while has been accomplished. The advice we have given has meant no more than that. When our patient returns and we analyze his condition we find that some of the symptoms have subsided; he may have gained a few pounds in weight and be quite energetic. In reality, there is little or no change in his condition; the benefit derived is little or none at all; the apparent improvement is but a screen behind which the disease is beginning its ravages, and once control is lost over the disease, it will go like wildfire. It is apparent that we have been losing time. To lose time in treating tuberculosis is a loss of very precious time: it cannot be made up.

To obtain results we hope for the treatment must be immediate and complete. We cannot afford to treat this disease by half way measures. To stop the great loss of life due to this disease our fight must begin early. To be sure we occasionally see a patient who is apparently able to get along without quitting work entirely, requiring only supervision, but these cases are usually the chronic fibroid type who do well for many years, save for an occasional relapse or reactivation, and may respond to a few weeks rest at home. Such therapeutics, however, do not apply to the early case. The chronic fibroid case has had many years in which to build up resistance and to learn how to take care of himself, while the early case has neither the resistance nor the necessary knowledge of the disease and what he must do. It is by instituting treatment at the very earliest moment that we can hope to do the most good to the early case. We cannot afford to wait; if we postpone immediate treatment, it may be too late to do any good.

It is well known that a tuberculous process tends automatically to quiet down, and this is the most unfortunate phase of its early pathology, for the disease makes its ravages behind a smoke screen of seeming well being and advances before we realize it.

It is estimated that of all hospitalized patients with tuberculosis only three per cent survive the fifteenth year after leaving the sanatorium. To be sure this figure is based on statistics including all stages of the disease. At any rate the number surviving is by far too small, and the reason for that is not a lack of treatment, but the fact that the tuberculous are not treated early enough. Even cases with good resistance and a none too virulent infection will invariably become advanced should treatment be delayed.

At the Rutland State Sanatorium the number of minimal cases admitted is only 20 per cent of all admissions; that is, 80 per cent are moderately advanced or far advanced. There must be a reason for the great preponderance of advanced cases. The reason for delaying treatment is often due to the apathy of the layman in not seeking medical advice. But it is within our power to advise treatment as soon as we have made the diagnosis.

In a current report issued by the Medical Reearch Council of England on the history of patients treated at the Frinley Sanatorium from 1905 to 1914, statistical evidence is found to support the opinion that the earlier the stage when the disease comes under sanatorium treatment, the greater the chance of survival. The study includes 3057 patients. The large majority of those discharged as "worse," died soon after discharge, about one-half of the deaths occurring in the first year. There were 79.3 per cent of the male patients admitted to the sanatorium in the incipient (minimal) stage, and 89.7 per cent of the female patients, who survived five years; the corresponding number of survivals after ten years being 65.2 per cent and 85.2 per cent respectively; while 56.8 per cent of the male patients who were moderately advanced cases on admission to the sanatorium were alive at the end of five years, and 38.2 per cent at the end of ten years, and 67.4 per cent and 49.7 per cent, respectively of the female patients. Of those discharged as "worse" 93 per cent were dead at the end of 13 years, and of these deaths 58 per cent occurred the first year after leaving the sanatorium.

Let us analyze these figures: Taking the male patients, 79.3 per cent of the minimal cases survived 5 years as compared with only 56.8 per cent survivals of those who were moderately advanced on admission; the group of minimal cases showed 65.2 per cent survivals at the end of 10 years, and only 38.2 per cent survived in the group which were moderately advanced on entering the sanatorium; those admitted as far advanced and discharged as "worse," 93 per cent were dead at the end of 13 years.

These figures are significant. Shall we say a challenge? They stare us in the face. Are we not capable of converting tombstones into monuments? We have diagnosed the disease but we have not availed ourselves of the opportunity to treat it on time. It is a most discouraging experience in our daily practice to care for these very patients who have progressed to the point of almost irreparable damage. It is, indeed, discouraging to see our Youth come in the very poorest of condition because of delayed treatment, and say to ourselves, "prognosis poor."

It is the duty of the profession to realize the importance of early treatment, for it is the instituting of early treatment that will help prevent an early case from becoming advanced. These patients come to the sanatorium depressed, yet hopeful. To realize later that their disease is advanced beyond the point of possible repair must, indeed, be a nightmare to the consumptive.

To stay off the appalling loss of life we must bend our every effort to treat the disease early. We cannot afford to wait for the appearance of a positive sputum before beginning treatment, for a great proportion of our minimal cases have no positive sputum; only 30 per cent of our minimal cases have a positive sputum.

To wait, then, for the appearance of a positive sputum, to prescribe a vacation, to send them to the country for a rest,—all these measures spell delay. To lose time in treatment tuberculosis is to lose very precious time.

Our foe is powerful and relentless. We must offer no quarter. To win the war we are engaged in, we must treat the disease as soon as we have recognized it. To wait is to take away from the consumptive his chance for recovery.

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INTERMITTENT VENTRICULAR FIBRILLATION WITH COMPLETE RECOVERY: REPORT OF A CASE

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THREE cases of ventricular fibrillation with recovery have been reported in the literature. In two[3], [4], the recovery was of short duration, thirty and thirty-six hours, and terminated in death. In the other case[1], that of a patient with auricular fibrillation and complete heart-block, three attacks of ventricular fibrillation developed during the administration of quinidin, but the patient was alive nine months later.

The Mayo Clinic case was that of a woman, aged sixty-five, who first came to the clinic in 1909 because of moderately severe exophthalmic goiter of one year's duration. She also had had a moderate degree of cardiac damage which was attributable to the goiter. Both superior thyroid arteries were ligated, and the patient was allowed to return home. Recovery was so complete that she did not return for further surgical treatment.

The patient came to the clinic again January 25, 1925. She had had a recurrence of the symptoms of exophthalmic goiter, which began seven months before, and a gastro-intestinal crisis five months before. During the crisis the patient was irrational for three days, and her pulse was totally arhythmic. Lugol's solution (liquor iodi compositus, U. S. P.) was administered three times daily in doses of 10 drops. The physical findings were characteristic of exophthalmic goiter: cardiac dullness extended 4 cm. to the right and 15 cm. to the left of the median sternal line; the systolic blood pressure was 142, and the diastolic 90; the heart rate was 120 at the apex; there were auricular fibrillation with a moderate pulse deficit, slight edema of the ankles, and a few moist râles at the bases of both lungs. Lugol's solution, 10 minims three times daily, was continued. January 27, the dose was increased to 10 minims four times daily because the patient showed evidence of intense stimulation. January 28, the basal metabolic rate was +57 per cent. January 29, the pulse deficit was less, but the heart rate remained high, from 120 to 145. Roentgenograms of the chest February 2, disclosed moderate enlargement of the heart. February 3, the patient had blurring of vision, and February 5, she had to turn her head to see the table at the right of the bed. She did not mention this at the time. The same day at 4:20 p. m., there was a sudden attack of syncope with marked cyanosis, a mild generalized convulsion with opisthotonos, and short periods of apnea. The heart rate at the apex ranged from 140 to 200 beats a minute and was totally arhythmic. During the periods of most profound cyanosis the heart sounds were not perceptible. Epinephrin, 5 minims of a 1:1000 solution, was administered subcutaneously. All this occurred in about fifteen minutes, after which the patient slowly regained consciousness. Electrocardiographic tracings taken during the attack showed intermittent ventricular fibrillation. At 5:25 p. m. the systolic blood pressure was from 160 to 170, and the diastolic from 80 to 100. The heart rate was 180, and the heart was totally arhythmic. February 6, the heart rate was from 102 to 104, and the fibrillation of the auricles continued throughout the period of observation. For four days the patient was disoriented, and a right hemianopsia, noted a few hours after the attack, persisted during this time. Another roentgenogram of the chest, February 6, showed moderate enlargement of the heart. Comparative studies and measurements of the roentgenograms are of no value as they were necessarily taken with the patient supine. The basal metabolic rate February 15 was +57, and March 13 +41. Lugol's solution was discontinued from February 6 until February 14, when it was again administered in doses of 10 minims twice daily, and later 10 minims three times daily.

March 24, partial thyroidectomy (resection of the left lobe) was performed. Pathologic examination disclosed diffuse parenchymatous hypertrophy. The operation was followed by a moderate reaction, with a rather slower decline of pulse rate than usual. The postoperative pulse rate reached 160. April 11, the patient was able to walk about the corridors wthout dyspnea or the appearance of edema, and she was allowed to return home. The trip, a distance of 450 miles, was accomplished without difficulty.

EXPLANATION OF ELECTROCARDIOGRAMS

The first electrocardiogram was obtained the day after the patient's admission to the hospital (January 26, 1925) (Fig. 1). The rate at this time was 150, and there was auricular fibrillation, with left ventricular preponderance.

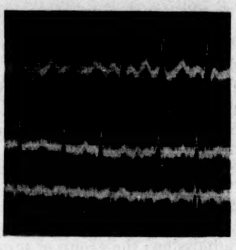

FIG. 1. Records taken January 26, 1925, the day after admission: Rate 150, auricular fibrillation, and left ventricular preponderance.*

An electrocardiogram taken shortly after the onset of the syncopal attack which was associated with generalized convulsions (February 5, 1925) shows rapid auricular fibrillation, rate 182, in Leads I and II, and in Lead III are seen some rather bizarre ventricular complexes differing in contour and in character from those of the preceding records, and occurring just before the onset of typical ventricular fibrillation (Fig. 2).

The electrocardiogram (Fig. 3) was taken a few seconds after that of Figure 2, and is recorded in Lead II. This tracing conforms to those of other published cases and to those of records of experimental ventricular fibrillation in dogs. At intervals, occasional ventricular complexes are discernible in this record, which are somewhat comparable to those in the previous records. This tracing agrees with the clinical observations during this attack in that the heart tones were absent for a very short period, and then reappeared. The fact that the patient recovered following such an alarming syndrome indicates that at times periods of coördinated ventricular activity occurred, permitting a fairly adequate systolic output.

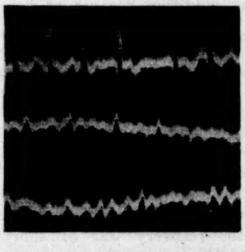

FIG. 2. Records taken February 5, 1925: Rate 182, auricular fibrillation. Lead III shows some bizarre ventricular complexes just preceding ventricular fibrillation.

The electrocardiogram (Fig. 4) was taken February 20, 1925. It was recorded in Lead II and shows a rate of 123, and auricular fibrillation.

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*1 cm. = 1 mv. in all records.

FIG. 3. Record taken a few seconds after Fig. 2: Lead II, ventricular fibrillation with occasional ventricular complexes which are somewhat comparable to those in the previous records.

The next record (Fig. 5), also taken in Lead II, was obtained March 21. The heart rate was 150 and auricular fibrillation still present. The last record was taken April 9, three days prior to the patient's dismissal from the hospital. It was recorded in Lead II (Fig. 6). The heart rate was 142, and auricular fibrillation was present.

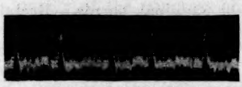

FIG. 4. Record taken February 20, 1925: Lead II, rate 128, auricular fibrillation.

Discussion

Speculation with regard to the cause of ventricular fibrillation in this case is interesting, and the following sequence of events is suggested as a possible explanation. H. S. Plummer has called attention to the fact that a peculiar mental status, the exact nature of which is as yet not clearly understood, and which is not infrequently observed in cases of exophthalmic goiter and of hyperfunctioning adenomatous goiter, may be attributable to cerebral edema. The peculiar train of cerebral phenomena in this case, before and after the attack, were not explicable by cerebral thrombosis, hemorrhage, embolism, or by an inflammatory condition of the brain, yet they could readily be due to a cerebral edema. The secondary manifestations of cerebral edema are not definitely understood. It is possible that the effect of this complication on the cardiovascular system, already overburdened and incompetent, was sufficient to permit the development of ventricular fibrillation, and it is probable that the injection of adrenalin was the deciding factor in the restoration of cardiac activity.

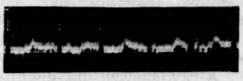

FIG. 5. Record taken March 21, 1925: Lead II, rate 150, auricular fibrillation.

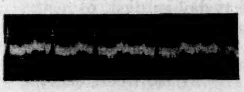

FIG. 6. Record taken April 9, 1925: Lead II, rate 142, auricular fibrillation.

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THE LONDON DEATH RATE

The rate of mortality in London for 1924 was 12.2 per thousand of the population, a slight increase over that of 1923 which was 11.4. The 1923 rate was the lowest ever recorded. The increase in 1924 is attributed to the mortality among children under five years of age due to measles. The cancer and tuberculosis rate remained practically unchanged.

The deaths from motor vehicles gave an increase of twenty-four per cent. as compared with the preceding year.

DEPARTMENT OF COMMERCE
WASHINGTON

Automobile Fatalities January 1 to August 15, 1925

Washington, D. C., August 31, 1925—The Department of Commerce announces that reports of automobile fatalities in 1925 have been received from 77 cities of 100,000 population or more. Thirty-six of these cities show more automobile fatalities in the four-week period ending August 15, than in the previous four-week period. Norfolk shows no fatalities for the last eight weeks, and in addition the following seven cities show no fatalities for the last four weeks: Dayton, Houston, Lynn, New Bedford, St. Paul, San Antonio, and Waterbury. New Bedford, with two deaths still holds the record for 1925.

For 57 cities with an aggregate population of 27 million, there were 2,878 automobile fatalities reported in the period January 1 to August 15, 1925, as contrasted with 2,885 such fatalities in the period January 1 to August 31, 1923. Of these 2,878 deaths, 368, or 13 per cent., were reported in the four-week period ending August 15, 1925.

Of the 66 cities for which comparisons are possible so far for 1923 and 1925, 36 show more automobile fatilities reported in the period January 1 to August 15, 1925, than occurred in the first eight months of 1923.

Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 11361

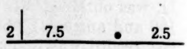
SURGICAL DEPARTMENT

An American contractor of sixty-eight came to the Emergency Ward November 25 complaining of intense itching of five weeks' duration. His father died of an acute attack of heart trouble. One sister died after childbirth because she was a "bleeder." One living brother had "hardening of the arteries" and another had rheumatic pains in the right shoulder. The patient's only child lived five days after very difficult delivery.

Though he said he had always been of nervous temperament he did not seem to be so, was intelligent and coöperative, and did not show his age. In childhood he had boils which broke into his ears. His left ear was somewhat deaf. At eighteen he had scarlet fever and gonorrhea without after effects. He had always been subject to severe colds with cough and white sticky mucus. For twenty years his left leg from the ankle to just above the knee had been tender to blows and felt cold, so that he had worn a special stocking to protect it at night. For about twenty years he had had "gouty" attacks of one or both feet twice a year; the affected foot and ankle were red, swollen, painful and tender, never for more than five weeks. He had occasional nosebleeds. At forty-nine he had an attack of fainting followed by bad feelings in the stomach and head for six months. Even now he occasionally felt uncomfortable when he looked upward suddenly. Before prohibition he drank about a quart of whiskey a month. He had taken very little alcohol since prohibition. He urinated once at night. At forty-eight he weighed 182 pounds, his best weight. Six weeks before admission he weighed 175.

Six weeks before admission he had a chill immediately after dinner. At eight o'clock he vomited everything eaten since noon. Two days, three days, and five days later he had chills and vomited. Five weeks ago he had jaundice and itching increasing for three weeks, then decreasing a little. Listerine gave the only relief. Since the onset of the jaundice his stools had been white and his urine dark and heavy. He had been troubled with gas, but this disappeared during the present illness. Since the onset he had urinated twice at night. He gave up work. Five days ago he was somewhat weak. He thought he had lost five pounds. Since the onset he had wanted to eat sour things.

Examination showed a deeply jaundiced man showing evidence of some loss of weight. Excoriations over the entire body. Sclerae yellow. Teeth poor. Pyorrhea. Apex impulse of the heart not recorded. Sounds rather faint. First sound snapping. No murmurs. Pulses and arteries normal. B. P. 150/80. Lungs clear. Liver enlarged. Edge felt. Round mass in the right abdomen which felt like the gall-bladder. Large indirect right inguinal hernia. Rectal examination not permitted on account of extreme tenderness. Hemorrhoids. Extremities and pupils normal. Reflexes. Ankle and knee-jerks not obtained even with reinforcement. No response to plantar stimulus. No evidence of sensory impairment.



Before operation T. 96.8°-99°, P. and R. normal. Amount of urine not recorded, sp. gr. 1.018, the slightest possible trace of albumin at the single examination, much bile, leucocytes. Hgb. 80%, leucocytes 9,800, polynuclears 80%, reds 3,910,000, reds and platelets normal. Wassermann negative. Blood group IV. Clotting time (1) 14 minutes, (2) 22 minutes, (3) 25 minutes, (4) 28 minutes, with $CaCl_2$ 25 minutes. Clot retraction good. Reds sedimented before clot was firm. Serum dilution 1:450; another examiner got 1:250. Non-protein nitrogen 60. Stools clay colored, foul smelling, guaiac positive at both of two examinations, strongly positive at one, bile negative at both. X-ray showed no definite evidence of gall-stones or of organic disease of the stomach or duodenum.

November 27, 28 and 29 5 c.c. of 10% solution of calcium chlorid was given intravenously.

November 29 operation was done. The patient made a good recovery from ether and seemed to be holding his own next day, though his condition was very doubtful. He was extremely jaundiced. December 1 he seemed rather bright. A subpectoral was followed by much bleeding. Catheterization gave no urine, although he had not urinated since the day before. That day he died.

DISCUSSION

BY DR. HUGH CABOT

I do not see that his family history or his previous history have any important bearing upon this condition. One might speculate as to whether he had in fact had "gout," but I can see no relation to the present situation. His consumption of alcohol might be regarded as excessive, but again I doubt its relation to his present difficulty. Up to his present illness there is no evidence of important loss of weight.

The present difficulty began with chills on four occasions followed by the appearance of apparently painless and profound jaundice. This jaundice is clearly of the obstructive type, since his own observations confirmed by the examination here show absence of bile in the stool. The absence of pain militates considerably against the view that the obstruction is due to gall-stones in the common duct. In the general examination there is some evidence of enlargement of the heart to the left, but no definite indication of hypertension. The liver is enlarged and a mass thought to be the gall-bladder was felt below it.

The conditions which we must consider are cancer, presumably of the pancreas obstructing the common duct or cancer of the gall-bladder with secondary invasion of the common duct. We must also consider cancer, syphilis, cirrhosis and abscess of the liver. The latter three can I think be excluded because of the very complete absence of bile in the stools. In none of these conditions would the flow of bile be completely shut off, though jaundice might occur with any of them. Primary infection with multiple abscesses of the liver can be excluded on the same ground, though abscess of the liver as a secondary matter may exist.

We come, therefore, to the consideration of the conditions which will produce complete obstructive jaundice. In practice they are two; cancer of the pancreas, the stomach or the gall-bladder, or stone. The absence of pain and the distention of the gall-bladder, if this observation be correct, would go a good way toward excluding stone in the common duct. The onset with chills, however, is much more likely to occur with this condition than with cancer. Of the various sources of cancer which might produce this situation that primarily in the stomach is apparently largely excluded by the X-ray; that primarily in the gall-bladder probably cannot be excluded, but is rarely capable of producing as complete obstruction. On the doctrine of probabilities, therefore, cancer of pancreas with obstruction of the common duct at the ampulla is the most probable diagnosis.

This disease cannot be cured by operation, but it is often a very slow moving affair and in favorable cases anastomosis of the distended gall-bladder either to the duodenum or to the stomach will palliate the symptoms and make the patient comfortable occasionally for as much as two years. Exploration, therefore, with this in mind is a justifiable operation.

It appears to make little difference whether the anastomosis is done to the duodenum or to the stomach, and it is commonly easier to do the anastomosis to the stomach. I have, therefore, generally preferred this method, though using both.

In regard to the risk of operation, it will undoubtedly be considerable. not because of the operation itself, which is generally relatively simple, but because of the liability to bleeding whether primary or secondary due to the profound and fairly prolonged jaundice. It will be noted that his clotting time was considerably prolonged. They evidently took every means to remedy this by the intravenous injection of calcium chlorid. This is of undoubted benefit, but is not always successful.

I am inclined to make a diagnosis of cancer of the head of the pancreas and to advise exploratory operation on the possibility that an anastomosis can be done.

DR. CABOT'S PRE-OPERATIVE DIAGNOSIS

Cancer of the pancreas.

PRE-OPERATIVE DIAGNOSIS

Carcinoma of the pancreas.

OPERATION

Gas and ether. Six inch upper abdominal muscle splitting incision.—While this patient was deeply jaundiced and in serious condition the operation was undertaken because a few minor details pointed to gall-stones and because the patient was sufficiently uncomfortable with the itching to demand an operation. The gall-bladder and common duct were found distended with a clear white material, the common duct to a diameter of about an inch. In the common duct beginning at the border of the duodenum and extending upward for about an inch there was a hard irregular mass shutting off the common duct. Above this mass the duct was very much distended. The liver was very dark and much enlarged. It had evidently stopped functioning. A cholecyst-gastrostomy with two rows of sutures was done. There was no breaking up of adhesions and no injury to the liver.

FURTHER DISCUSSION

The findings at operation tend to suggest a condition which I should have considered, namely, the rare primary cancer of the papilla. The finding of white bile at once makes the prognosis serious, since it means that the hepatic function has been largely obliterated and will very likely not be resumed again. The operation of cholecyst-gastrostomy was, I think, clearly indicated. The story after operation is that of a patient overwhelmed by disturbance of liver function. He apparently had anuria, but I doubt whether any condition of the kidney will be found which will justify regarding this as due to any kidney lesion. Whether or not his death was hastened by bleeding cannot be prognosticated from the evidence. There is commonly found considerable intra-abdominal bleeding, and it may have occurred in this case. On the other hand I see no reason for assuming it.

Necropsy should show cancer obstructing the common bile duct. I am not prepared to be more definite, since primary cancer of the papilla is so rare. The balance of the findings should be a much enlarged liver with perhaps multiple abscesses. If the observation in regard to enlargement of the heart is correct, he will very likely show arteriosclerosis with hypertrophy and dilatation of the heart.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the ampulla of Vater.
Cholecystogastrostomy for carcinoma of ampulla of Vater.

DR. HUGH CABOT'S DIAGNOSIS

Cancer obstructing common duct.
Arteriosclerosis.
Hypertrophy and dilatation of the heart.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Adenocarcinoma of the common bile duct with occlusion.

2. *Secondary or terminal lesions*

Icterus.
Hemorrhage into the abdominal wall, retroperitoneal tissues, gall-bladder, and gastro-intestinal tract.
Focal necrosis of the retroperitoneal fat tissue.
Cholecystogastrostomy.
Arteriosclerosis.
Arteriosclerotic degeneration of the kidneys.
Slight hypertrophy and dilatation of the heart.

3. *Historical landmarks*

Slight omental inguinal hernia, right.
Chronic pleuritis.

Dr. Richardson: The head was not examined.

The margins of the operation wound and the abdominal muscles in the region generally were markedly infiltrated with blood. This extended into the retroperitoneal tissues in places and there was much blood in the prevesical space. The peritoneal cavity contained a very small amount of blood. The right inguinal canal admitted two fingers and contained in the region of the upper part a small mass of omentum. There was a slender band of adhesions between the omentum and the canal wall. The left canal was negative.

An anastomosis was established between the stomach just above the pylorus and the gall-bladder. The opening was patent; the anastomosis was in good condition. The stomach contained a small amount of thin bloody fluid in the region of the pyloric end.

Small intestine: In the region of the jejunum there was a small amount of blood like material. The intestine otherwise was negative.

The mesenteric and retroperitoneal glands were negative. There was no fluid in the pleural cavities. There was a moderate amount of chronic pleuritis on the right, slight on the left. The lungs showed moderate edema.

The aorta and great branches showed a moderate amount of arteriosclerosis, and there was slight hypertrophy and dilatation of the heart.

The liver weighed 1500 grams. The surface was smooth and the tissue markedly bile stained. The gall-bladder was anastomosed to the stomach as mentioned. It was distended with blood clot. The mucosa was negative. There were no stones. The cystic duct contained some blood but was otherwise negative. The hepatic duct was dilated to 3 cm. in circumference. The mucosa was negative. In the region of the upper half of the common duct the first portion was dilated to 3 cm. The mucosa was negative. In this region along the length of the duct for about 3½ cm. the duct was occluded by a mass of new growth tissue. The wall of the duct in this region was thickened and its mucosal side presented a somewhat cauliflower-like mass of new growth which occluded the tube—adenocarcinoma. The duct below the mass was free and negative except that the wall was slightly thickened. The pancreas was not involved by the growth. The duct of Wirsung was negative.

The kidneys were rather small and showed arteriosclerotic degeneration.

FURTHER DISCUSSION BY DR. CABOT

The necropsy findings do not lend color to the view that post-operative bleeding was an important factor in his death. The description of the lesion appears to show that it was a primary adenocarcinoma of the common duct, a lesion so rare that we may perhaps be pardoned for having missed the diagnosis. The findings of focal necrosis in the retroperitoneal fat raises a question of a lesion of the pancreas, but this apparently did not exist. The kidneys show rather more arteriosclerotic degeneration than I had expected, and very likely this influenced them to quit work when they might otherwise have kept going for a somewhat longer period. On the other hand this, I think, would not have affected the outcome and, if his kidneys had held up better, he would have died in about the same time in any case.

I note with interest that nothing was found to account for the chills which he had at the beginning of the fatal illness. They must, of course, have been produced by infection presumably in the liver, but this evidently did not go on to abscess formation. The case is of interest largely on account of the rarity of the lesion.

CASE 11362

CHILDREN'S MEDICAL DEPARTMENT

A PREMATURE male infant twenty-two days old was admitted January 8. The chief complaint was convulsions. His father and mother were living and well. The mother had had no other pregnancies. A grandfather had tuberculosis and cancer. The child was normally delivered at eight months and weighed 6⅛ pounds at birth. He was breast fed every two hours during the day and twice at night.

For three days the child had refused its food and could not be made to take fluids. The day before admission the mother thought he was yellow, and the day of admission still more yellow. The evening before admission he had his first convulsion, lasting five minutes, with tonic and clonic spasms, fixed eyes, and frothing at the mouth. During the night he had four or five more convulsions and the morning of admission as many.

Examination showed a well developed but poorly nourished infant who during the examination had repeated tonic convulsions with fixation of the eyes, arrested respiration and frothing at the mouth. He frequently became cyanotic during the attacks. The skin was dry, with loss of elasticity. The reflexes were very active. Chvostek's sign was easily obtained. There was no Trousseau. Upon lightly patting the abdominal muscles there was flexion of the thighs on the pelvis.

The temperature was 103° to 102.2°, the pulse 159 to 153, the respiration 58 to 53.

The convulsions continued. The child was given 50 c.c. of saline intraperitoneally and 150 c.c. of 5 per cent. glucose subpectorally. He grew steadily worse, and died the evening of admission.

DISCUSSION

BY DR. FRITZ B. TALBOT

The outstanding feature of this case is convulsions in a premature infant. There are only a few diseases which are common in the first three weeks of life; they include icterus neonatorum, congenital stenosis of the pylorus, injury to the brain at birth, and hemorrhagic disease of the new-born. Of these diseases the child apparently had icterus neonatorum. This, however, would not explain the symptoms of convulsions. This might be explained by hemorrhage of the brain at birth if the baby were younger, but it is almost beyond the range of possibility for the child to be born normal and remain so for three weeks and then have convulsions due to an injury three weeks earlier, which did not cause any convulsions at that time. Occasionally convulsions are due to an enlarged thymus. There is no positive evidence in this case which would make this a possibility.

The Chvostek's sign, which in older children is a sign of tetany, probably is merely an explanation of the extreme irritability of all the nerves rather than the specific irritability of the facial nerve found in tetany. It is possible that the child had some form of meningitis. The physical data available, however, do not make it possible to do more than venture a guess.

The diagnosis would have to be prematurity and convulsions.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Prematurity.
Convulsions.

DR. FRITZ B. TALBOT'S DIAGNOSIS

Prematurity.
Convulsions.

ANATOMICAL DIAGNOSIS

Purulent meningitis.
Acute encephalitis.
Slightly defective closure of the foramen ovale.

DR. RICHARDSON: Head. The pia was infiltrated with thin pale cloudy fluid, and over the convexities there were patches of dirty yellowish gray exudate. At the base of the brain there was a small amount of cloudy fluid and very slight coating with dirty reddish fibrinous exudate. There was no definite exudate along the fissures of Sylvius or between the frontal lobes. The brain weighed 390 grams. The tissue showed no definite lesions. The pineal and pituitary glands were negative. The ethmoidal and sphenoidal sinuses were negative. The sections from the pia and the brain showed an abundant exudate in which mononuclear cells predominated, but there were enormous numbers of streptococci. No tubercle bacilli were found. The brain tissue showed much infiltration by mononuclear cells,—purulent meningitis and acute encephalitis.

Trunk. The skin was sallow. In the anterior abdominal wall, lower left quadrant, was a brown-red spot. There were brown-red spots beneath the pectorals. The subcutaneous tissues, anterior thoracic wall, were infiltrated with thin pale clear fluid. There was subcutaneous fat in small amount. The muslces were thin and pale.

The lung tissue was spongy, pale red, and yielded a small amount of thin reddish frothy fluid.

The circulatory apparatus was negative except that there was a slightly defective closure of the foramen ovale.

NOTE BY DR. TALBOT

At the age of twenty-two days a purulent meningitis without any obvious source of entrance to the body is extremely rare. A streptococcus meningitis is more often found at this age than the other types. It usually comes from some infection in other parts of the body, such as an infected umbilicus, and in all probability is merely a localized expression of a general septicemia. There is no specific treatment which has as yet been developed to stop such infection.

CASE 11363

Surgical Department

An Italian laborer of twenty-four was brought to the Emergency Ward December 26 deeply unconscious. An indefinite history was given by his wife. For a month he had had constant headache and drowsiness and had been mentally dull and unwilling or unable to answer questions. Most of the time he had been in the house. For two days early in the month he had had a temperature of 103°. For the past week he had been in bed, torpid, and for six hours in coma.

Examination showed a young Italian in deep coma with slow shallow respiration through tracheal râles. At times he was completely flaccid, at times quite rigid, especially on the right side. He was incontinent of urine. The pupils were fixed and dilated. The neck was not stiff. There was no response to supraorbital pressure. Both ear drums were slightly dull, the left somewhat pink, thickened and retracted. The heart was slow, otherwise normal. The blood pressure was 130/80. The lungs were clear except for tracheal râles. The right chest was better aerated than the left. In the morning the right arm jerk was greater than the left but scarcely increased, the abdominal reflexes were absent, the right knee-jerk was increased and greater than the left, and there was sustained bilateral clonus and definite bilateral Babinski; no Kernig. In the afternoon the left pupil was more dilated than the right. There was slight external strabismus with slow deviation. The discs showed very early choking, if anything slightly more marked on the left. The disc was not wholly obliterated on either side. The deep reflexes of the arms were slightly exaggerated, about equal, the left knee-jerk was absent, the right slightly hyperactive, the ankle-jerk was slightly greater on the right than on the left, and there was a suggestion of Oppenheim on the right; no Babinski.

Before operation the temperature was 99.6°, the pulse 55, the respiration 12, the leucocytes 16,000. The urine is not recorded. X-rays of the skull were unsatisfactory on account of poor coöperation on the part of the patient. As far as could be determined however no definite pathology was present. The mastoid cells were fairly well shown and appeared normal. The pineal gland was not visible.

Caffein was given and a lumbar puncture done which showed an initial pressure of 400 mm. with apparent block, although the hydrodynamics were not satisfactory. It gave slightly opalescent fluid which showed 350 cells, 61 per cent. lymphocytes, total protein 70, sugar 82, (blood sugar 116,) Wassermann negative.

The evening of admission operation was done. The patient was sent back to the ward in very poor condition, rapidly grew weak, and died that night.

Discussion

BY DR. W. JASON MIXTER

NOTES ON THE HISTORY

A very indefinite history suggesting increased intracranial tension, and, on account of the temperature of 103°, suggesting also some infectious process.

NOTES ON THE PHYSICAL EXAMINATION

The examination shows a man in deep coma, the rigidity on the right side suggesting the possibility of a left-sided brain lesion. We must remember, however, that he may have had a right-sided brain lesion with complete flaccid paralysis, and that the rigidity on the right side is simply what remains of his normal tone.

The appearance of the ear drums suggests the possibility of infection in the ears. There is nothing marked however.

A slight increase in tendon reflexes on the right, sustained clonus and Babinski in a case of this sort do not mean a great deal. They simply suggest to my mind some extensive brain lesion, possibly tumor, possibly abscess. I do not think that we can pin anything on that, do you, Dr. Ayer?

Dr. J. B. Ayer: No.

Dr. Mixter: The change in the picture in the afternoon means comparatively little. Any case with extreme increase in intracranial pressure, and particularly where that pressure has come on rather rapidly, is apt to have a changing reflex picture.

I think that all one can gather from the examination as given in this history is that the patient probably had marked increase in intracranial tension. There seems to be a little more suggestion of a lesion on the left side of the brain than on the right. Have you anything to add to that, Dr. Ayer?

Dr. Ayer: I think we cannot say anything more than that. The fundus examination seems to be absent.

Dr. Mixter: The condition of the fundi is not mentioned in the history. There are various things we do not know so far. Will Dr. Fremont-Smith discuss this spinal puncture?

Dr. Frank Fremont-Smith: The fluid was under markedly increased pressure,* with 350 cells of which some twenty per cent. were polynuclears. So far as that part of the examination goes it might be consistent with several diagnoses. Tuberculous meningitis will give a fluid of high pressure with a few polynuclears. Syphilitic meningitis can give the same, although usually the patient will not be deeply in coma from syphilitic meningitis with only 350 cells. Syphilitic meningitis is ruled out by the negative Wassermann. Lateral sinus thrombosis is a possibility, but the absence of septic temperature or signs of mastoid disease are sufficient to dismiss it from consideration.

The differential diagnosis in this case—the negative Wassermann having ruled out lues—was between tuberculous meningitis and brain abscess. In tuberculous meningitis we get a cell count not infrequently as high as 350, but in a well developed case of tuberculous meningitis there is almost invariably a diminution in the sugar content of the spinal fluid. In the very early stages it may be normal* or a little elevated, but in a case which has gone so far as to produce coma one can confidently expect a diminished sugar content unless there is some complication such as diabetes which would give a high blood sugar. In this case the blood sugar is within normal limits,—hence, if this case is tuberculous meningitis we should expect to find a low sugar content. We do not find it. The spinal fluid sugar was 82 mgm. per 100 c.c.—a high value, which in this case argues strongly against tuberculous meningitis.

We have analyzed seventy-seven fluids from thirty-one cases of proved tuberculous meningitis. The average sugar content is 26 mgm. per 100 c.c. The highest sugar we have had in any case was 57 mgm. per 100 c.c., and that was an early case and the sugar fell progressively as the disease advanced. The lowest figure we have had is 9 mgm. per 100 c.c. In contrast encephalitis lethargica, poliomyelitis, and brain abscess all have a normal or high sugar content. In abscess there is a good deal of variation in the cell count, which may be hardly above the normal limits, but when increased it almost always has a definite percentage of polynuclears.

The protein in brain abscess is apt to be relatively low as compared with the cell count. One case showed 230 cells, with normal protein. Another had a protein of seventy and another a protein of thirty-six, while in tuberculous meningitis the protein is very definitely increased, often going very high. Where the cell count is as high as over 200 we can be sure that the protein will be definitely elevated in tuberculous meningitis.

Encephalitis lethargica was considered clinically as one of the possibilities. The high pressure in the first place is extremely unusual in encephalitis lethargica. The cell count of 350 is strongly against it. In a series of some 700 spinal fluid counts reported by the Association for Research in Nervous and Mental Diseases a cell count of over 300 occurred in fewer than ten cases. The protein would have been possibly consistent, and the sugar would have been consistent with encephalitis lethargica. The point I wish to make is that no single test in the fluid would be conclusive. But by bringing together the various findings of pressure, cells, protein, sugar, and in some cases chlorids, and considering these facts in relation to the clinical picture, particularly in relation to the stage of the disease, whether early or well advanced, we have a composite picture of greatest diagnostic importance. In this case we were able to establish the diagnosis by this means.

Dr. Ayer: Do I understand that from the fluid you would be willing to make a diagnosis of brain abscess?

Dr. Fremont-Smith: I am not sure that I could say that. With the fluid and the patient I should be willing and was willing to make a diagnosis of brain abscess. The fluid picture does not fit in with any other diagnosis.

Dr. Ayer: It is easily the most likely; but not pathognomonic?

Dr. Fremont-Smith: I remember a glioma deep in the frontal lobe, in contact with the ventricular wall, which gave a similar picture, both clinically and from the fluid examination. The fluid contained a moderate cell increase, among which a few polynuclears were seen. We made the diagnosis of abscess. At operation the tumor had largely degenerated, the central portion containing liquid necrotic material a smear of which showed polynuclears. Cultures were sterile. So we cannot say that the fluid in the case we are discussing is pathognomonic of brain abscess. Any other condition, however, giving this picture must be extremely rare.

Dr. Mixter: In other words the recent additions to our knowledge of cerebrospinal fluid work help us in this case. Here is a patient who enters the hospital in coma, whose examination and history are most unsatisfactory, who may be put down as brain tumor, abscess, encephalitis, meningitis, tuberculous meningitis, or any of a number of diagnoses. The cerebrospinal fluid findings strongly suggest abscess. The neurological picture, what little there is, suggests to me a left-sided lesion. I do not think I should want to go any further than that.

According to the history the X-ray examination was negative. In such a case as this the X-ray examination would be of little value anyway. The only thing we could expect to demonstrate would be a possible lesion of the mastoid. I should simply say that these plates are unsatisfactory, but that the mastoids seem clear.

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*Normal findings in lumbar spinal fluid and blood plasma. The readings are given in milligrams per 100 cubic centimeters except where otherwise indicated.

Spinal fluid: Cells 0 - 5 per cu. mm., protein 20 - 40, sugar 50 - 70 (fasting), chlorids 720 - 740, pressure 80 - 190 mm. of H_2O.

Plasma: Protein 6,200 - 8,000, sugar 70 - 110 (fasting), chlorids 570 - 620.

DR. MIXTER'S PRE-OPERATIVE DIAGNOSIS

Brain abscess, left.

PRE-OPERATIVE DIAGNOSIS

Brain abscess (?) left frontal lobe.

OPERATION

Without anesthesia a one-inch incision was made in the left temporofrontal region and a trephine hole made through the skull. A needle was inserted backwards into the temporal lobe. No resistance was felt. The needle was withdrawn and passed forward into the frontal lobe. Marked resistance was felt, and on passing this resistance a cavity containing thick pus was reached. About 30 c.c. of pus was evacuated. The bony opening was enlarged, packed with cotton and the skin sutured over it in expectation of establishing a permanent drainage in forty-eight hours if the patient should survive.

Further Discussion

Dr. Frank Fremont-Smith: There is one other point that might be mentioned. In the diagnosis, as Dr. Mixter pointed out, the physical findings suggest a left-sided lesion because of the increased reflexes on the right on two separate occasions. We were able to go a little further in localization, placing the abscess either in the left temporal or the frontal lobe—more probably in the latter. Operation was done over the region between the frontal and temporal lobes, giving access to both; and we were justified in this localization by the finding of the abscess in the left frontal. We reasoned that if the diagnosis of abscess is made we have a right to use a possible source of infection, as an aid to localization. The occipital lobe or cerebellar abscess or a temporal lobe abscess most frequently comes from an ear. We had no history of an ear. We had negative eardrums and reasonably good plates giving negative mastoids. We had no evidence in the body of another focus of infection. The most common source of abscess in the occipital, temporal or cerebellar regions is absent, and occipital or cerebellar abscess might well give localizing symptoms early. This leaves on the left side of the brain the motor region—which is ruled out by the absence of paralysis—and the frontal lobe. The history, although unreliable, suggests frontal lobe. The man had been dull, unwilling to answer questions for a period of weeks. X-rays were also taken with a view to ethmoidal and frontal sinuses, and did not show any pathology. A negative X-ray of mastoids is good evidence against mastoid disease, but negative X-rays of frontal and ethmoidal sinuses is not reliable evidence against active disease in these sinuses. Hence by a process of elimination, with no source in the ear and no known source in the body such as heart or lungs, it was not unreasonable to localize the abscess pretty well forward, coming from one of the frontal sinuses or ethmoidal sinuses on the left side.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Abscess of left frontal lobe of brain.
Drainage of brain abscess, left frontal lobe.

DR. W. JASON MIXTER'S DIAGNOSIS

Brain abscess, left frontal lobe.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Abscess of brain, left frontal lobe.

2. *Secondary or terminal lesions*

Purulent sinusitis, left frontal, ethmoidal and sphenoidal.
Otitis media, left.
Edema of lungs.
Soft spleen.

3. *Historical landmarks*

Slight chronic pleuritis, left.

Dr. Richardson: In the left middle ear there was a small collection of pus coverglass from which showed pneumococcus-like organisms. The brain weighed 1640 grams, including the pus. There was quite a collection of pus rather deep in the left frontal lobe and walled about by a thick pyogenic membrane. Cover-glass from the pus showed pneumococcus-like organisms. Extending back from there, from the region of the frontal lobe on the left, there was purulent sinusitis, frontal, ethmoidal and sphenoidal. Coverglass showed pneumococcus-like organisms.

The organs of the trunk were practically negative. There was edema of the lungs, some slight chronic pleuritis, and a soft spleen.

Dr. Ayer: This seemed to be a pretty straight case. An interesting thing is the diagnosis, which certainly I did not know as I went along. I was very much impressed with certain events in favor of subtentorial abscess. The partial block obtained in the fluid was unexpected. It might mean that there was some lesion present in the fourth ventricle or about the foramen magnum which would cause that block. I think Dr. Fremont-Smith's analysis of the diagnostic points is well taken. It would seem, putting everything together, that it ought to be a fronto-parietal lesion, with abscess most likely, and that is what it turned out to be.

From the etiological point of view abscesses in this situation are usually, I think I am right in saying, metastatic from elsewhere, and of course are frequently multiple. But in this case it did not seem to be metastatic and was almost surely associated with ethmoidal and sphenoidal infection. It is interesting that though the ear showed clinically nothing but opaque drums Dr. Richardson was able to show that there was a middle ear infection on the left side, which however can hardly account for the abscess by direct extension. It is perfectly possible that the pneumococci were blood-borne and it was not by direct extension. I do not think we have proof that this was by direct extension. That of course brings up the important question as to hematogenous and direct infection of the nervous system. I think we have to leave it a little in doubt in this case whether it is direct or indirect infection of the brain.

Dr. J. H. Means: Wasn't the brain abscess directly over the ethmoidal sinus? As I recall it the sinuses were found directly under the abscess, and on opening them they were found to be full of pus.

Dr. Fremont-Smith: There was an osteomyelitis involving the posterior wall of the frontal sinus and the superior walls of the ethmoidal sinuses within a half centimeter or less of the wall of the abscess.

Dr. Richardson: In the anterior fossa floor, left side, and in the region of the frontal and ethmoidal plates the surface of the bone presented a small area of granular roughening and softening. The dura and pia on the side of the brain showed a little sticky exudate.

Dr. Ayer: That would seem to make for direct extension, and yet it is interesting that the middle ear abscesses and these frequently do not show direct continuity. They occur one, two or three centimeters deeper. That has been explained by venous drainage and a backing-up process from an infected area. I suppose that would be a direct extension, but it is in a way a retrograded venous infection.

A very interesting and important case, and the next patient might get well instead of dying as this patient did.

Dr. Means: I wonder if it would be permissible to retrace the steps in diagnosis. In the first place the diagnosis was made of increased intracranial pressure. The next step was to decide to what this was due. It was thought to be an abscess because of leucocytosis in the blood coupled with no fever. Next came the positive findings of a few polynuclear leucocytes in the spinal fluid, and the negative findings against tuberculous meningitis. Then as to side: of course he had only two sides, but there was some suggestion that it was the left, so we may assume the diagnosis of side was not guesswork. Then Dr. Fremont-Smith's analysis showing that it was probably in the frontal lobe seems to me very interesting indeed. I think it was a beautiful piece of diagnosis. Unfortunately it did not lead to proceedings that were curative.

Dr. Ayer: The one thing we need to add to this is twenty per cent. polymorphonuclears, which is, of course, consistent with meningitis, consistent with an acute syphilitic condition, which seems to be ruled out by the Wassermann, but inconsistent with encephalitis. A fluid where the sugar is high is inconsistent with any form of bacterial meningitis, and is almost unknown with tuberculous meningitis. So it leaves us with an aseptic meningitis, which is pretty consistently found with any abscess near the cortex.

RATS AND RAT KILLERS

The four standard and approved methods of combatting rats are: (1) the rat proofing of buildings; (2) the removal of rat food supply; (3) trapping; (4) poisoning. These methods if diligently carried out may be depended upon to give results. Another method of combatting rats is much advertised but it is said to be uncertain as to results. It consist in giving rats food which contains a living culture of bacteria with the idea of infecting rats with a disease which they will pass on to other rats before they themselves die of it. Contrary to the claims of effectiveness for such products, most authorities who are not interested in their sale point out that they are ineffective and expensive. The germs used appear to be only mildly pathogenic for rats.

While the method of combatting rats by means of bacteria, viruses, etc., is supposed to be harmless to human beings, it is a fact that the bacteria used belong to the food poisoning group of germs. The germ often used is described as belonging to the paratyphoid B group. It is well known that some of the germs in this group can cause serious disease in man. Nobody knows when the germs used to kill rats may develop pathogenic power and thus be dangerous to man. Experts strongly advise against the use of such products.

Persons who give contracts for rat extermination would do well to ascertain the methods of extermination used. Recent inquiries have elicited the information that a living culture is often used in combatting rats under such conditions that the owner of the property where it is used knows nothing about it. This is said to have occurred even in food establishments where there would be a possibility of the germs getting into the foods and being distributed in that way.

It may be of interest in this connection that outbreaks of food poisoning have been traced to germs found normally in the alimentary tract of rats and mice. In some instances foods causing such disturbances, have been shown to have had an opportunity to become infected by mice and rat drippings. Thus it appears that germs may be passed from rats to humans through the human food supply and this is another reason why cultures of living germs should not be fed to rats.—*Bulletin, Connecticut State Department of Health.*

THE BOSTON
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WHAT. OF THE MASACHUSETTS MEDICAL SOCIETY?

If our members would take the time to read Burrage's History of our State Society and make an analytical comparison of this with other state medical societies, some changes might be inaugurated.

There are many of our members who know little of the work of the founders of this venerable organization or its traditions and much less of the activities of other state medical organizations. Without some understanding of the work that has been accomplished here and knowledge of the activities of progressive societies elsewhere, there is likely to exist a provincial self satisfied spirit which may be a bar to progress. We may wake up some day and find that our sister states are forging ahead.

The *New York State Journal of Medicine* has entered upon a study of the other state societies and in the August 1925 number presents a study of affairs in Michigan. It is set forth that the secretaries of the constituent county societies in Michigan met last April and discussed plans for state-wide activities. The fundamental ideals of a county medical society, as set forth by Dr. Warnshuis are:

1. To enlist and interest all the eligible members of the profession in your county in the work of the County Society.
2. To cause your Society to enhance the type of medical service in your community.
3. To re-awaken the spirit of organized effort for the attainment of the mastery and honor of our profession.
4. To beget professional fellowship.

The suggestions for the major activities of the State Society were:

1. Bring about better scientific programs for your regular meetings.
2. Foster, inspire, and institute, with the aid of selected members, an increasing number of public meetings for the education of the public in regard to scientific medicine.
3. Adopt and develop a plan of periodic physical examinations.
4. Join with and assume directing control of all public health work, clinics, and hospitals in so far as medicine is involved.

Many of these activities have been carried on in Massachusetts but the more general interchange of ideas among our District Societies would lead to the adoption of plans found to be effective in other progressive centers. When a particularly attractive meeting has been staged in one District it might be repeated in another. It has been felt that we ought to have a closer fellowship throughout the state than is secured by the annual meeting, because the attendance at that time has probably seldom, if ever, exceeded twenty-five per cent. of our membership. It is true that this has been met in a degree by union meetings of two or more districts and the visits of the President and his associates to the District Societies, but the repeated demonstration of lack of coöperation on legislative matters, for example, indicates that we are not always a united body. It may be that our sentiments are in favor of high ideals but there might be more evidence of that spirit of sacrifice which would lead to constructive effort at times.

In civic and business life it is customary for representatives of organizations to study similar bodies in other places in order to secure first hand information relative to progressive activities. It might be well for the Massachusetts Medical Society to send delegations to study the work done in other states and to submit reports which will keep us in harmony with organized medicine.

If the *New York Medical Society Journal* carries out its program, we shall soon have an opportunity to see ourselves as others see us. An independent estimate of our behavior may do us good.

Let us stand by the President and his committees this year and make it memorable for advance in scientific work and medical politics.

AN IMPROVED MILK SUPPLY

The July Bulletin of the Health Department of Boston contains a timely article concerning the milk supply of the city. The sale of certified milk has increased somewhat; about 103 quarts a day bringing the total consumption to about 3,307 quarts daily, or .89 per cent. of all milk consumed.

An advance step was taken last winter by the passage of Chapter 310, of the Acts of 1924. Grade A milk was the subject of this legislation. Grade A milk may now be produced only at dairies receiving a permit for that purpose, and the permit may be revoked by the Board of Health granting it if the milk room is not clean, the cows healthy, the udders clean at milking time, the cows milked with clean, dry hands into small top milking pails, the milk removed immediately from the stable and cooled quickly to a temperature of 50 degrees or less. Such milk must bear upon the cap "Grade A Pasteurized" with the date of pasteurization. This milk shall be kept at 50 degrees Fahrenheit after pasteurization and shall contain not more than 25,000 bacteria per cubic centimeter and not less than 4 per cent. fat. This milk must be not more than 48 hours old and contain not more than 250,000 bacteria before pasteurization.

Other sensible regulations concerning the production of this milk apply, and of great importance is the rule that this milk shall be covered with a cap or seal protecting the tip of the bottle from contamination. We may hope that the time will come when all milk sold whether or not Grade A in type shall be so protected. Grade A milk comprises 4.17 per cent. of the milk sold each day, the amount now being 15,688 quarts per day against 19,059 quarts in 1923.

A small quantity of common raw milk is still supplied to the public, in all about 2.05 per cent. of the total supply. Slow progress is being made in extending the sale of bottled milk in restaurants and hotels.

Milk remains the most valuable and the most dangerous food product. Its status as regards public health is slowly improving, but certain principles must be adopted universally before it becomes as safe as is humanly possible to make it. The goals we should work for are as follows:

1. All milk should be produced under regulation at least as stringent as those that apply to Grade A milk.
2. No milk should be sold raw unless certified.
3. All herds producing milk to be sold in Massachusetts should be regularly tuberculin tested, and preferably accredited.
4. All milk should be supplied to the ultimate consumer in the original bottle.
5. All milk should be pasteurized in the bottle except certified milk which is not pasteurized.
6. All bottles should be capped so as to protect the lip of the bottle.

Furthermore it is advisable that medical commissions certifying milk should be strictly overseen by the State Department of Public Health.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Lowsley, Oswald Swinney. Subject: "Major Urological Operations Under Regional Anesthesia." Dr. Lowsley is a graduate of Johns Hopkins, a member of the A. M. A., F. A. C. S., American Urological Association, Consultant in Urology at the Hospital for Ruptured and Crippled and several other hospitals and Director of the James Buchanan Brady Foundation.

Birnie, John M., A. B. Williams, M. D., Harvard, F. A. M. A., F. A. C. S., Member of New England Surgical Society and visiting Surgeon, Springfield Hospital, Mary Lane Hospital and Monson State Hospital. Dr. Birnie writes on "Prolapse of the Uterus."

Gibson, Cole B., M. D., Atlanta and graduate, Army Medical School; Superintendent State Tuberculosis Sanatorium for Children, Meriden, Conn., member of National and many other Tuberculosis Associations. The title of Dr. Gibson's paper is "Diagnosis and Treatment of Juvenile Tuberculosis."

Bigelow, Georgf H., M. D., and Doctor Public Health, Harvard; Director of Communicable Diseases, Mass. Department of Public Health. Subject: "Remarks Relating to the Study of Cancer."

Joress, Mark H., M. D., Tufts; Fellow A. M. A., member National Tuberculosis Association; Assistant Physician, Rutland State Sanatorium. Subject: "Importance of Early Treatment in Pulmonary Tuberculosis."

Draper, W. F., A. B., Amherst; M. D., Harvard; Assistant Surgeon General, U. S. Public Health Service; member American Public Health Association. Dr. Draper's article is entitled "Occurrence of Smallpox in the United States and Measures Taken by the Federal Government for Its Control."

Haines, Samuel F., and **Willius, Fredrick A.,** write on "Intermittent Ventricular Fibrillation with Complete Recovery." Haines, Samuel F., M. D., Harvard; Mayo Clinic, Rochester, Minn.; devotes himself to internal medicine. Member of the Massachusetts Medical Society. Willius, Fredrick A., M. D., University of Minnesota Medical School. Connected with the Mayo Clinic.

MISCELLANY

ANNOUNCEMENT OF NEW REPORTS

The Children's Bureau of the United States Department of Labor has just issued a report on "Laws Relating to Sex Offenses Against Children." This publication (Number 145) includes abstracts and texts of State age-of-consent laws and of laws relating to abduction, seduction, prostitution, and to other sex offenses, so far as they concern minors. The abstract of the laws was made by Reuben Oppenheimer, and their compilation was the work of Lulu L. Eckman. The text of Federal laws which have some bearing upon the subject, such as laws relating to the white-slave traffiic, or to the transportation of aliens for immoral purposes, is also included. Single copies of this report will be issued free upon request.

Another legal report of interest to child-welfare workers, soon to be issued by the Children's Bureau, is publication Number 148. This is a report on "Adoption Laws in the United States," prepared by Emelyn Foster Peck. A preliminary analysis of the development and character of adoption legislation in the United States is followed by the text of sections from recent adoption laws of certain States. Professor S. P. Breckinridge of the University of Chicago advised with the Bureau in connection with the preparation of this report. It will be ready for distribution early in the fall.

U. S. Department of Labor Children's Bureau, Washington.

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CORRESPONDENCE

THE CONNECTICUT STATE MEDICAL SOCIETY

COMMITTEE ON CLINICAL CONGRESS

August 28, 1925.

Editor, Boston Medical and Surgical Journal:

The Connecticut State Medical Society will hold a Clinical Congress at Yale University in New Haven, on September 22, 23 and 24, 1925.

The program provides for both clinic and practical papers by experts in their various lines. It is intended that the papers shall present subjects from the standpoint of diagnosis and treatment by the general practitioner.

A copy of the preliminary program is inclosed.

A large attendance has already been assured, and as enrollment is open to all members of the American Medical Association, whether or not resident in Connecticut, it has occurred to us that, in the interests of physicians outside of Connecticut, you might desire to bring to their attention through the medium of your journal their opportunity for enrollment, if they will communicate with me as chairman of the Committee on Enrollment and Publicity, and it is suggested that enrollment so far as possible be made before September 15. The enrollment fee is $10.

Very truly yours,
ROBERT L. ROWLEY,
Chairman of Enrollment and Publicity Committee.
79 Elm Street, Hartford, Connecticut.

PRELIMINARY PROGRAM

Tuesday, September 22

A. M.
10:30 Head Injuries — Francis C. Grant, Philadelphia.
11:30 The Use and Abuse of Cardiac Stimulants—Lewis A. Conner, New York.
P. M.
2:00 Laboratory Procedures That Every Practitioner Should Know—Ralph G. Stillman, New York.
3:00 The Significance of Hematuria — Arthur L. Chute, Boston.
4:00 The Conservative Treatment of the Toxemia of Pregnancy—John Osborn Polak, Brooklyn, N. Y.
8:00 Open Meeting—President Angell presiding.

Wednesday, September 23

A. M.
8:30 What the General Practitioner Should Know About Carcinoma of Breast — Burton J. Lee, New York.
9:30 Indications for Tonsillectomy—James H. Erskine, New York.
11:30 Intravenous Therapy—Walter A. Bastedo, New York.
P. M.
2:00 Toxin-Antitoxin—William H. Park, New York.
4:00 Infections of the Urinary Tract in Children—Henry G. Bugbee, New York.
8:15 Theatre party.

Thursday, September 24

A. M.
8:30 The "Acute Medical Abdomen"—David Riesman, Philadelphia.
9:30 The Treatment of Fractures—P. D. Wilson, Boston.
11:30 Differential Diagnosis of the Commoner Diseases of the Skin from Syphilis (Illustrated)—Grover W. Wende, Buffalo.
P. M.
2:30 Neglect and Mistakes in the Diagnosis and Treatment of Syphilis — John H. Stokes, Philadelphia.
3:00 Painful Affections of the Heart—Frank T. Fulton, Providence.
4:00 The Treatment of Functional Nervous Disorders — Lawrence K. Lunt, Stockbridge, Mass.

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NEWS ITEMS

MME. CURIE recently visited the mine at Jackyniov from which the ore was taken which was used in her successful efforts to procure radium. She is now studying the ores of ionium, from which she hopes to demonstrate the value of ionium in the treatment of malignant growths.

THE FIRST INTERNATIONAL CONGRESS ON MALARIA will be held in Rome from October 4 to 6 next. The subjects to be considered are the causes of malaria as shown in the biology of the parasites and the treatment and epidemiology of the disease.

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REPORTS AND NOTICES OF MEETINGS

AMERICAN BOARD OF OTOLARYNGOLOGY

THE next examination given by the American Board of Otolaryngology will be held at the Cook County Hospital, Chicago, on October 19th, 1925. Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

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SOCIETY MEETINGS

DISTRICT MEDICAL SOCIETIES

Essex North District Medical Society

Wednesday, September 2, 1925—At 2 P. M., a combined meeting with Essex South, Middlesex North, and Middlesex East, at Danvers State Hospital, Hathorne.

Wednesday, January 6, 1926—The semi-annual meeting at Haverhill.

Wednesday, May 5, 1926—The annual meeting at Lawrence.

NEW ENGLAND STATE MEDICAL SOCIETIES

The annual meetings of the New England State Medical Societies are scheduled as follows:

Vermont State Medical Society—St. Johnsbury, Oct. 15-16, 1925.

Notices of meetings must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear.